



LEIA Safety Information Sheet

Industry Guidance for Working at Height

Prepared by the LEIA Safety and Environment Committee with support from SAFed and acknowledgements to the Health & Safety Executive for use of their material.

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INTRODUCTION

This document has been produced by the Lift and Escalator Industry Association, with the support of the Safety Assessment Federation (SAFed), to give advice on the Work at Height Regulations and to establish best practice by providing practical guidance on safe working at heights during installation, modernisation and maintenance of lift, escalator, and similar equipment.

The guidance, which has been prepared following consultation with the Health & Safety Executive (HSE), addresses the risks from work at height in the industry and assumes that other risks are controlled by established control measures. Such controls are detailed in LEIA Information Sheets, BS 7255 Safe Working on Lifts, BS7801 Safe Working on Escalators / Moving Walks, BS9102 Safe Working on Lifting Platforms and a range of HSE Approved Codes of Practice and Guidance.

Whilst every effort has been taken in the production of this guidance, it must be acknowledged that it should be read in conjunction with the Work at Height Regulations and other appropriate HSE guidance etc. The guidance should not be taken as an authoritative interpretation of the law but as guidance to it.

In essence the Work at Height Regulations establish a hierarchy, which in descending order of acceptability is

- Avoid work at Height
- Use collective fall prevention safeguards such as working platforms with guard-rails and toe boards
- Use collective fall protection such as nets and airbags
- Use personal fall prevention such as work restraint harnesses/lanyards
- Use personal fall protection such as harnesses/lanyards

The Work at Height Regulations applies to all work situations where a person could fall any distance liable to cause personal injury. Every potential fall situation needs to be assessed.

The legislation can thus be viewed as applying retrospectively and therefore it is necessary to ensure that all workplaces and activities meet the requirements of the Regulations. Safe systems of work at height need to be established and in order to do so, risk assessment must take place. This includes an assessment of the tasks, procedures, processes, machinery, tools etc and will include each lift, and escalator and surrounding work environment. Indeed, every aspect of the work needs to be assessed and this includes any personal protection equipment to be worn as a result of the risk assessment.

The lift and escalator industry mainly operates on client's premises, and it should be recognised that employers and clients have duties under the Health and Safety at Work etc Act to provide safe systems and places of work, as far as reasonably practicable. When establishing safe working at height these duties cannot be overlooked and it is essential that the client as a duty holder is involved in risk assessments and to agreeing the necessary control measures.

There should be adequate planning for work at height to ensure the safety of all who work or who are exposed to the risks created by the industry's activities. Control measures need to be jointly agreed between the lift contractor and the client, so to ensure that the legal responsibilities of both parties are satisfied.

It should not be overlooked that many of the risks associated with working on lifts could have been avoided at the design stage of the building and the lifts. Where lifts and escalators are being installed / modernised on sites which come within the scope of the Construction (Design and Management) Regulations then designers (which include architects, consultants, manufacturers etc.) must take account of the potential for falls from height. Their designs and specifications should ensure that the necessity to work at height is avoided and where this is not possible then risk of falls is removed or reduced.

New safety legislation frequently inspires innovation and therefore when selecting work equipment especially access / egress equipment, consideration should be given to new products and designs which are now readily available, and which satisfy the new safety standards.

For those not conversant with the Work at Height Regulations it is strongly advised that they read the Health and Safety Executive's leaflet

Working at height a brief guide <https://www.hse.gov.uk/pubns/indg401.pdf>

WORKING ON LIFTS

PIT ACCESS including use of pit ladders

Before accessing the lift pit, a risk assessment must be carried out to identify the hazards. Most lift companies insist that personnel accessing the pit conduct a check to ensure that the landing door lock and the pit switch are functioning correctly. These access procedures usually require that the lift car is set in motion and using a door release key the landing doors are opened, stopping the lift car at a “convenient” height above the access point.

On opening the lowest landing door, the lift pit stop switch should be safely and easily accessible e.g., within one metre from the landing. Operating the switch inevitably requires leaning into the lift pit and in these circumstances a door restraining device should be used to keep the doors open should balance be lost and a fall into the pit occurs. In cases where the pit switch is fixed at a low level so that it is accessible from the pit floor as well as the landing, the safest manner is to kneel down thereby lowering the body’s centre of gravity and reducing the likelihood of a fall.

Barriers should be fitted around the landing entrance or there should be some form of door restraining device to close the doors to a minimal gap to protect people on the landing area.

The Work at Height Regulations apply whenever a fall could result in injury, careful assessment of this risk needs to be taken as experience shows that accidents can occur when entering and leaving pits.

The law requires safe access and egress to all workplaces, as far as reasonably practicable. When the lowest lift landing doors are open to allow access / egress to the pit, it is important that work surfaces are kept clear of tripping hazards and operatives do not work with their backs to the fall hazard. Landing doors should be kept open for the minimum amount of time. All lift pits should be equipped with a ladder or other means for accessing/egressing the pit safely.

Except in case of shallow pits a ladder is normally provided for access to ensure safe access / egress. In shallower pits adequate hand and foot holds should be provided. On many lifts pit access ladders are permanently fitted. The location of the fixed pit ladder in relation to the lowest landing entrance is important, as it is imperative for users of the pit ladder, that they are able to get on and off the ladder comfortably and safely. Because of their location, fixed ladders may not always be the safest solution. Unless it is safely accessible from and to the landing, the ladder may create unacceptable risks.

Consideration must be given, when completing the site risk assessment, to whether a fixed pit ladder offers safe access and egress to and from the pit. If a safe handhold and three points of contact on the ladder cannot be maintained, then clearly a fixed pit ladder is not acceptable.

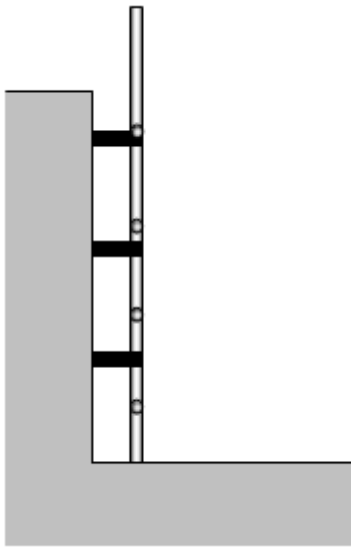
Many pit light switches are located in the shaft and should be safely accessible on opening the door. If access to the switch is from the ladder, then the level of illumination at the entrance should be sufficient to access the ladder safely before operating the pit light switch.

In terms of access / egress into the pit, the key question is “Can it be achieved safely?” If the location of the ladder and pit light switch requires stretching out from the landing with insufficient secure handholds, then clearly there is a risk of falling and the situation is not acceptable. If the risk of falling is reduced by kneeling to access the equipment, then this needs to be understood and followed, as part of the safe system of work, by all those involved.

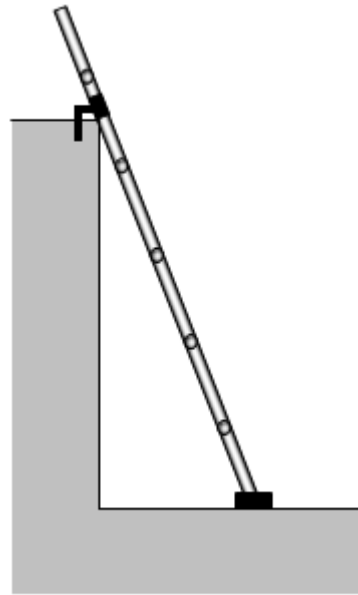
When using a fixed ladder, it is important to check that it is secure. There have been cases where poor fitting techniques have resulted in permanent pit ladders pulling away from the wall. Deficiencies presenting risk of injury should be reported to the appropriate person. Pit ladders are considered to be part of the lift installation and as such the lift owner has a duty to ensure that these are in safe working order for use by those persons who are likely to use them. Therefore, engineers should not only report any defects to a member of the lift owner’s management, but also to their own lift company management in order to follow up with recommendations for improvements to the client.

Where a lift pit is particularly deep, due to the increased risk of injury should a fall occur, some form of fall protection should be considered. This may include the fitting of a wall-mounted lifeline and arresting block and harness

attachment provision accessible from the landing. Alternatively, rather than climbing up and down a vertical ladder, it may be safer to use a ladder set at an angle (e.g., 75 degrees). Current standards for new lifts require a permanent means of access to be provided that is easily accessible from the landing door so that persons can descend safely to the floor of the pit. EN81-20 requires an access door to the pit to be provided when the pit is deeper than 2.5 metre.



Fixed Ladder



Removable Ladder

The above diagrams show the features that should be considered for fixed and removable pit access ladders, which should be considered as part of any risk assessment. For safe access to a lift pit all the questions should be able to be answered with “Yes”. If not, then action should be taken to remedy the situation immediately and advice should be sought before proceeding. Where the ladder is not fixed and could be left in place, then an interlock should be used to ensure that the ladder is in the stored position.

Fixed Pit Ladder Assessment	Yes/ No
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Are the handholds and treads easily accessed from the landing?	
Is the construction sound?	
Are fixings secure?	
Are the tread pitches even and correctly spaced?	
Is the tread to wall distance adequate to allow secure purchase?	
Are treads clear of oil and water?	
Are soles of boots/shoes free of contamination?	

Removable Pit Ladder Assessment	Yes/ No
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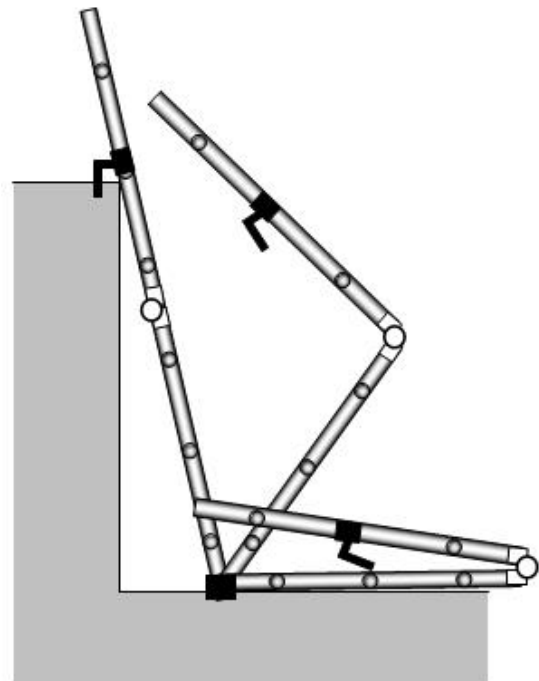
Is the ladder of sound construction?	
Is the ladder adequately secured at the top and bottom?	
Are the tread pitches even and correctly spaced?	
Is the ladder incline correct 1:4?	
Does the ladder extend to an adequate height above the sill?	
Ease of location of ladder? - Storage, accessibility, portability	

Jointed Pit Ladder

- Two-piece jointed ladder fixed to the shaft floor.
- The ladder is equipped with a hook to fit the landing door track.
- The ladder is pulled up from the pit floor with a chain which has to be fixed to the pit wall. The ladder locks in automatically when the ladder is unfolded.
- On new lifts where EN 81-20 applies ladders should be permanently available in the lift well.
- Ladders that unfold from the pit floor can be used if the original design safety space is not reduced.

On a pre1998 manufactured lift a portable ladder stored adjacent to the lift installation or a pull up ladder either straight or fold up type fixed in the pit floor may offer an acceptable safer means of access and egress than a fixed vertical ladder.

The use of a jointed pit ladder will often infringe the pit safety dimensions and should not be used unless safety dimensions are retained.



Jointed Pit Ladder

If such ladders are used, then the method of putting them into position and removing them must be achieved safely. In most cases a removable ladder will not be suitable for deep pits as the pure logistics of lowering and retrieving a lengthy ladder will create serious manual handling risks and fall hazards. The ladder must be capable of being held safely in position e.g., by a device as the pit or floor hook into the landing door track and be of sufficient length i.e., one metre above the landing to provide adequate handholds.

Storing a portable ladder adjacent to the lift is not acceptable on new installations. Any means of access provided which is not permanently installed in the lift pit must be subject to a Design Examination Certificate from a Notified Body.

Attention is drawn to Annex F of BS EN 81-20:2014 which gives detailed requirements for Pit ladders – guidance which may be useful where a new pit ladder is introduced on an existing lift installation.

USE OF PORTABLE AND STEP LADDERS

Every year many people are injured whilst using ladders, more than half these accidents occur because ladders are not securely placed and fixed, and of these many happen when the work is of 30 minutes duration or less.

Other causes of ladder accidents include climbing with loads, over-reaching or balancing, using ladders when the user's footwear or the ladder rungs has oil, grease or other slippery substance on them. These incidents indicate that ladders are used when other equipment could have been more suitable.

The Work at Height Regulations 2005 has placed increased focus on the selection of work equipment and in particular the use of ladders and stepladders. All ladders must be EN131 Professional for use at work. The following guidance underlines the minimum requirements that must be taken when ladders and stepladders are used.

Every employer must ensure that a ladder is used for work at height only if a risk assessment has determined that: -

- The use of more suitable work equipment is not justified because of the low risk and the short duration of use, (guideline is a maximum of 30 minutes in one position depending on the type of work being undertaken and the findings of the site-specific risk assessment); or

- Existing features on site, which cannot be altered or influenced, means other more suitable work equipment cannot be used.

It is essential that the following conditions are satisfied before the use of ladders is justified: -

- Any surface that a ladder rests on must be stable, firm, of sufficient strength and of suitable composition to safely support the ladder so that the rungs or steps remain horizontal and can support any loading intended to be placed on it.
- A ladder must be safely positioned to ensure its stability during use.
- A ladder must be prevented from slipping during use by:
 - Securing the stiles at or near their upper or lower ends.
 - An effective anti-slip or other effective stability device; or
 - Any other arrangement of equivalent effectiveness.
- A ladder used for access must be long enough to protrude sufficiently above the place of landing to which it provides access. It is recommended that ladders protrude at least a minimum of 1 metre above its landing point unless other measures have been taken to ensure a firm handhold.
- Interlocking or extension ladders must not be used unless its sections are prevented from moving relative to each other while in use.
- A ladder must be prevented from moving before it is stepped on.
- Where a ladder or run of ladders rise a vertical distance of 9 metres or more above its base, then the provision of suitable and sufficient safe landing areas or rest platforms should be provided where reasonably practicable. This ensures that users have a safe refuge to rest when climbing or descending the ladder run. EN81 states that for new lifts truly vertical ladders are only allowed to a height of 1.5 metres, after this they must have a landing. If this cannot be met the ladder must be subject to Design Examination. EN 81 also requires that it should not be possible to fall for more than the height of the ladder in an area of 1metre from its base.
- Every ladder shall be used in such a way that: -
 - A secure handhold and secure support are always available to the user; and
 - The user can maintain a safe handhold when carrying a load. In the case of a stepladder, maintaining a handhold may not be practicable when a load is carried, but the risk assessment must demonstrate that the use of a stepladder is justified because of: -
 - The low risk; and
 - The short duration of use.

Regulations do not ban ladders but require consideration to be given to their use. They require that ladders should only be considered where the use of other more suitable work equipment such as tower scaffold, podium steps is not appropriate. Where ladders and stepladders are used, they should only be used as a workplace for light work of short duration.

Ladders should only be used once the risk assessment has identified that they are suitable and sufficient to carry out the intended low risk work as safely as possible for the user and others in the surrounding areas.

Examples of what to consider when completing the risk assessment include:

- The work activity...is it of a light nature? Does it require strenuous effort e.g., tightening up rope terminals, pulling cables or ropes...if so, the ladder could slip so would not be suitable work equipment.
- The equipment to be used e.g., use of a drill. If so, a ladder is liable to slip - would podium steps or staging be more appropriate?
- Is a handhold available...essential on a stepladder.
- The duration and frequency of use: is the work activity of short duration i.e., no more than 15 - 30 minutes, or is it repetitive?

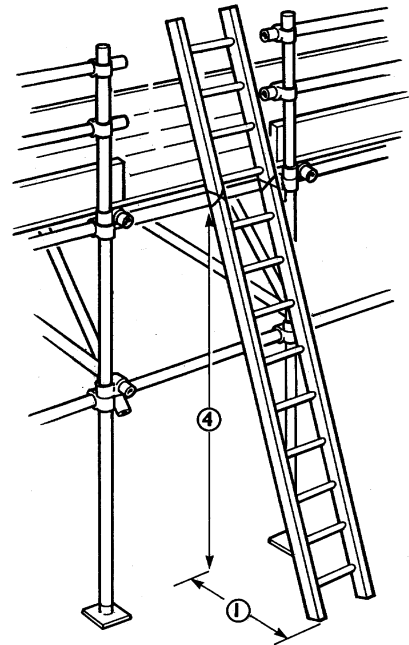
- The location where the work activity is due to take place, i.e., presence of hazards such as overhead power lines, open excavations, etc.;
- The dimensions of the workplace and any more suitable work equipment, to ensure a safe working area and safe passage.
- The working environment, e.g., weather conditions; lighting, hot or cold workplace; ground conditions; are there space constraints?
- The condition and stability of existing work surfaces; (both at ground level and vertical resting surfaces)
- The weight and size of any loads to carry whilst on a ladder. Any load over 10kg needs to be assessed for manual handling as well as falling. Any load over 25 kg is not acceptable.
- The physical capabilities of the workers, e.g., strength, stature, vertigo sufferers, pregnancy.
- Are other people working in the same area, will members of the public be affected?
- Any other additional risks posed by the installation, use, dismantling or removal of the work equipment.
- In the case of access and egress, what is the distance to be traveled?

Any use of ladders on top of lift cars (e.g., to access sheaves) must be subject to detailed risk assessment taking account of the nature of the task to be performed and the hazards created and a decision whether other work equipment e.g. scaffolded platform would be more suitable must be made. **Don't forget the first consideration of any risk assessment for undertaking work at height should be - "Can the work activity at height be avoided?"**

SAFE USE OF LADDERS

If ladders are selected, then the following guidance should be followed:

- Make sure the ladder is suitable for its purpose and any loads you intend to place upon it.
- The ladder should be stood on a firm and level base.
- Anything slippery should be removed e.g., oil.
- The ladder should be set at the correct angle of 75° or a ratio of 4:1
- The top or bottom of the ladder should be either lashed or tied on. Ideally on both stiles with a proprietary device to stop it slipping but whatever means is used that ladder must be secured against slippage before being used.
- Face the ladder when climbing and descending.
- Take extra care when using ladders near entrances, roadways or other places where there is a possibility of somebody colliding with it. Erect barriers or warning notices as appropriate.
- Ladders should be removed; or if boarded, chained and padlocked to prevent unauthorized access outside working hours.
- Do not overreach sideways from a ladder, move it if necessary. Keep your navel [belt buckle] inside the stiles and both feet on the same rung throughout the task.
- Watch out for live overhead cables, particularly when using metal ladders
- Consider the potential loadings of persons, equipment and materials.
- Do not carry loads which prevent the use of both hands when climbing or descending
- Maintain a position at least three clear rungs from the top.
- When using a ladder for access, it must extend at least 1 metre above the landing or have a secure handhold available.
- Ladder hoops or other measures be taken to reduce the potential for falling.
- On a step ladder, stand no higher than two clear steps from the top.
- Stepladder restraints must be fully open, and any locking device must be used.
- On step ladders avoid side-on working if it is absolutely necessary to use them tie off safely.
- When working on a ladder ensure that the person on the ladder always has three points of contact, e.g. two feet and a hand. May be short exceptions e.g., starting a screw.
- When working on a ladder, handhold must be available, and legs used to support the person with leg contact on the ladder above and below the knee.



- Beware of wet, or slippery rungs or floor surfaces. These should be cleaned before climbing or descending.
- Do not rest ladders against weak or slippery surfaces.

INSPECTION OF LADDERS

The Work at Height and Provision and Use of Work Equipment Regulations require that where the safety of work equipment depends on how it is installed or assembled, it is not used unless it has been inspected in that position. Work equipment such as scaffolds, work platforms, collective safeguards [e.g., nets and airbags] and ladders must be inspected before they are used.

All ladders and stepladders should be inspected in position to ensure that the equipment is safe to use. Where access ladders form part of a scaffold system they must be inspected every 7 days.

Apart from their inspection before use, they should be examined by a competent person to ensure they remain in good condition. In order to identify each ladder, they should be marked by some unique identification e.g. serial number, code etc.

Inspections should include checking rungs, treads, cross bars and stiles for defects (especially identifying any crushing marks in timber), rung to stile connections, ropes (on extending ladders), cables, condition of feet and all fittings, locks, pulleys, rivets, screws and hinges. It is good practice to keep a record of the inspection or use tags to identify that inspections have taken place.

Further checks should be carried out to cover the possible defects that occur in different types of ladders.

Timber ladders should be checked for rot, decay or other damage such as warped stiles, excessive cracks, splintering and wear and tear at the head and foot of the stiles, they should not be painted as any defects may be concealed by the paint.

On metal ladders the inspection should cover twisting, distortion, oxidation, corrosion and excessive wear, especially on the treads. Reinforced fiberglass ladders should be checked for mechanical damage.

All portable ladders and stepladders should be checked to ensure that the rubber feet are still in place and in good condition as this is a frequent cause of ladders slipping.

Any ladder found to be defective should be clearly labeled or marked as such and withdrawn from use until repaired or destroyed.

Any access ladder provided by the client for use by lift engineers and inspectors is the responsibility of the client. Such equipment should be subject to the same inspections by the client, but the user should still check the ladder before climbing or descending. Lift companies should contact the client for evidence that any such inspections are carried out. Any defects found should be notified immediately to the client to enable him to fulfill his legal duty to have it repaired or replaced.

Attention is drawn to the resources on HSE website covering safe use of ladders and stepladders

[Work at height - Using ladders safely \(hse.gov.uk\)](https://www.hse.gov.uk/workatheight/ladders.htm)

ACCESS TO BOTTOM DOOR LOCKS

Door locks on the bottom landing doors are normally accessed from inside the lift car but side opening bottom door locks may need to be accessed from the lift pit. A detailed safe system of work must be developed including careful selection of the access equipment in the lift pit. Where possible an access podium or platform with adequate handrail should be used. This type of access equipment is the preferred option for lifts with deep pits. Where the work is deemed as light work and short duration i.e., inspection of the bottom lock contacts, and a ladder is selected to be used then the stability of the ladder, condition of the pit floor, suitable ladder resting place and means of securing the ladder at the base and / or top need to be considered. A stepladder may not necessarily be suitable, as their

configuration may not allow the user to get close enough to the lock mechanism due to its location in the corner of the shaft or the height it is from the pit floor. See Section on Ladders for details of safe working on ladders.

WORKING ON TOP OF LIFT CARS

The lift industry established some years ago that any void greater than 300 mm x 300 mm is a potential fall hazard. It has also taken the view that where somebody is working within one metre of such a void, action must be taken to ensure that a fall cannot occur. These dimensions have been established by generic risk assessment and the actual safe working distance from the fall hazard must be determined by specific risk assessment taking account of the risk of tripping and slipping when close to the fall hazard.

As stated in the introduction to this guidance, the new regulations apply to all work situations where a person could fall any distance liable to cause personal injury and every potential fall situation needs to be assessed. Clearly if a person is close to a void when on top of a lift car, and personal injury could result from a fall, then action must be taken.

The Work at Height Regulations establishes a hierarchy whereby work at heights should be avoided whenever it is reasonably practicable to do so. So rather than working on top of a lift car, the first consideration must be - can the work be conducted elsewhere. For example, if repair or adjustment is required on a door gear can it be carried out with the car positioned conveniently at the landing rather than the engineer working from the car roof?

If work at height cannot be avoided such as work on a lift car top, the legislation requires “collective safeguards” in preference to individual measures, such that the precaution against a possible fall protects everyone rather than just individuals wearing fall protection equipment.

Examples of collective precautions on top of lift cars include:

- **Reducing the size of the fall hazard by filling voids in the shaft** with guarding so that the fall hazard no longer exists. Full height lift division screens which are designed to guard against moving lifts in adjacent shafts frequently achieve this however it is important to prevent falls that any such screening is strong enough not to flex as a result of someone making contact with it, thus creating a gap through which a person can still fall. Risk assessment is essential to ensure that any such screen is suitable to protect against such falls.
- **Extending the car roof to reduce the void created between the car roof and lift shaft.** However, the features of the lift equipment and shaft may not make such extensions possible and so they must be considered very carefully to avoid contact with structural features of the shaft and lift equipment. The strength of any extension should take account of the possibility that someone, either intentionally or inadvertently, may stand or place materials on it.
- Where car top extensions and filling the void are not practicable or the shaft screen is of inadequate strength, the **use of handrails (sometimes called balustrades/guard rails) must be used.**

For many lift companies this is the preferred method of collective protection against falls from the top of lift cars.

BS7255:2012 Code of Practice for Safe Working on Lifts details the foregoing precautions and states that they should be taken in the order as stated.

The height of balustrades to prevent falls defined in EN81-20:2014 for new lifts is at least 700mm where any void is between 300mm and 500mm and at least 1100mm where the void is greater than 500mm.

Where balustrades are introduced onto existing lifts care must be taken to ensure no additional risks are created such as introducing a crushing risk at top of well.

It should be noted that during the installation period the heights specified in EN81 – a lift standard may not comply with standards imposed by principal contractors and others and balustrades may need to be higher at these times.

Attention is drawn to BS EN 81-20 Clause 5.4.7 onwards Car Roof which goes into detail on heights and position of balustrades and toe boards.

Attention is also drawn to LEIA bulletin Are You aware 52 Rev 1 which explains the requirement for greater height of balustrade during construction.

The HSE Approved Code of Practice to the Management of Health and Safety at Work Regulations states that risk assessment should ensure that significant risks and hazards are addressed. This should take account of non-routine operations. In many situations fall hazards on top of lift cars may not present a risk during routine work but inevitably at some point, lift engineers and inspectors will have to approach the fall hazard. Action should be taken to address this reasonably foreseeable risk.

In the past the lift and escalator industry has relied on fall arrest equipment to protect against falls. However, with the introduction of the Work at Height Regulations, the provision of personal fall protection does not meet the requirements of Schedule 5 Part 1. The use of personal fall protection (i.e., work restraint) whilst acceptable in some work situations does not provide collective safety (See Appendix A). Therefore, if a fall hazard is present the provision of collective safeguards such as car top extensions, filling the voids or fitting handrails must be considered in the first instance. See order of preference as detailed in BS7255 Safe working on Lifts para 4.17.2.

However, due to the unusual working conditions not normally experienced elsewhere, additional precautions should be taken when working on observation and partially enclosed lifts. When protection against falling is not incorporated in the design of the car top, fall protection equipment should be worn and attached to the anchor point provided ideally used as work restraint. Care should be taken when the safety harness is worn to avoid possible snagging of the lanyard, etc.

OPENING LANDING DOORS - When lift car is not at that level.

The criteria for any safe system of work is that by following the procedures, those involved will not incur any injury to themselves or others. When it comes to opening lift landing doors, any safe system must provide that no-one is exposed to the potential of injuring themselves (or others).

It is envisaged that normally there are only two situations that arise where lift landing doors are opened without the lift car being present at that floor.

These are: -

- Opening the lowest landing door to access the lift pit. Guidance on this activity is dealt with elsewhere in this Industry Guidance.
- Opening the landing door to access the top of the lift car. Most lift companies now prescribe in detail how employees will access the top of lift cars for manual and motorised doors. Such procedures include the checking of the door locks and top of car controls before stepping onto the lift. These access procedures usually require that the lift car is set in motion in a downward direction by initiating two car calls, one for the floor immediately below the floor a person is on and the other for the lowest car call. These calls would be initiated from the most convenient landing relative to the work being carried out. Using a door release key, the procedures require that the landing doors are opened, stopping the lift car at a "convenient" height i.e. the distance above the landing. When opening the landing doors under these circumstances the doors should only be opened sufficiently wide to observe where the lift has stopped.

What is a convenient height is really dependent on the task involved. If the person is accessing the top of car, then a height above landing floor of 300 – 400mm allows access to the car control switches and ease of stepping on the car top once the controls are validated. In terms of opening the landing door, to access the top of the lift car, what is being achieved is that the lift car itself acts as a barrier to protect from falls down the lift well.

If the task involves working on the front of car from the landing e.g., work on the door gear, the car should be stopped in a higher position. However, if the lift car doors are open whilst working from the landing, then a fall hazard exists and protective measures e.g. a barrier needs to be in place.

The two activities above are the only situations where lift landing doors should normally be opened when the lift car is not level with the landing.

In exceptional circumstances it may be necessary to open the landing doors with the lift car above or below that landing during the release of trapped passengers. The release of trapped passengers in a stopped lift car is considered high risk and must be undertaken by a competent person who has undergone specific training to undertake the task. In these circumstances the appointed person must take charge of the situation and reassure the trapped passengers that they are not in any danger, and they should not attempt to open any doors or step from the car until they are told to do so.

Opening a lift landing door to locate where the lift is in the shaft should be avoided. Ideally the lift should be located by communication with the trapped passengers, by viewing it through a landing door vision panel or information given by the position indicators. Many lifts are fitted with a lift car position indicator / alarm in the controller or machine room. Nowadays such items are reasonably priced and fitting enhancements of this kind is strongly recommended. On traction lifts the ropes are frequently marked to indicate that the lift is at a floor level, however these markings over time may disappear.

Some lift landing doors can be parted sufficiently to see where the lift is positioned whilst still maintaining the integrity of the door lock. If it is essential to open doors to check where the lift is located then the landing door(s) should not be opened greater than 150mm, and this should be done at the lowest level.

Opening landing doors – BS 7255 Para 5.18 recognises that there may be a need to open a landing door when the lift is not at that landing, this endangers persons in the vicinity of the lift entrance. A person working on a lift should not allow the landing doors to remain open any longer than necessary. If the landing door is to be left unlocked and open for any length of time, a barrier should be erected to protect the open landing entrance. A suitable barrier should be provided the owner.

FALLS THROUGH LIFT CARS ROOFS

Most modern lifts have been designed to take the weight of people and tools working on the top of lift cars. Account should be taken if more weight than would be reasonably foreseeable is to be put on the car roof e.g., when adding more weight to the counterweight during a lift car refurbishment. Many observation type lifts are fitted with glass roofs. While access to the top of car inspection controls may have been considered at the design stage and a safe position can be achieved to drive the car, little or no thought may have been given to work on the more remote parts of the lift top e.g., changing guide shoes, replacing light bulbs. All such work needs to be carefully planned to ensure no load is placed on fragile parts of the roof.

On some older goods lifts access to the top of car was not considered at the design stage and safe access has only been achieved through the provision of a plank or boards. The site risk assessment must identify such situations so that action can be progressed to achieve a safe place of work. The risk assessments will also need to take into account tripping hazards and oil in the car.

Lifting platforms may also have weak roofs and care must be taken to establish the integrity of the roof before standing on it. Warning notices will often draw attention to this.

ACCESS ACROSS ROOFS

In many lift installations, access to machine rooms is gained by crossing roofs. The Work at Height Regulations requires that this access should not present a risk to the safety of people who use it or those who may be affected by its use.

There are two distinct requirements to be addressed these are: -

- If access involves a significant risk to the safety of persons should a fall occur.

- The protection of those working or having access below whose safety is at risk from falling objects or materials.

Ideally safe access and egress should be by permanently installed equipment that adequately controls any risk. Where this is not the case then action is required to install these facilities or to provide them whenever the work requires. This may include sufficient lighting to be able to see the hazards in the first place.

FALLS THROUGH ROOFS / FROM ACCESS ROUTES

The potential for falls through fragile surfaces (such as roof lights and weak roofs) when working on lifts and escalators is frequently overlooked and yet falls through such surfaces give rise to more fatal accidents in the construction industry than any other cause. Likewise on building maintenance, falls through fragile surfaces account for one quarter of deaths in the sector.

Risk assessments should include checks to ensure that any surface or material adjacent to where people are working or accessing / egressing can safely support the weight of a person and any materials that they may, foreseeably, be carrying. The client/responsible person for the premises can assist in the assessment as they should have the knowledge of the site conditions and the risks to the health and safety of visitors. Account should be taken of persons inadvertently stepping or relying on the roof surface to support their weight, such as a lift engineer walking across a roof to a machine room. Access routes should be arranged and clearly marked so as to avoid passing near fragile material e.g., roof lights, glass, cement sheeting. If this is not possible, it is essential that the client/responsible person take steps to identify all fragile material and decide whether stringent precautions such as handrails or coverings must be provided. Ideally on roofs, a safe access route should be indicated so that the route does not go within 2 metres of any fragile material or an unprotected edge. Remember that plastic roof lights discolour with age or may have been painted in the past making them very difficult to see. Also, it is not uncommon to find that voids through the building, venting to the atmosphere on flat roofs, may have been covered when the roof had been re-covered.

It is safer to assume all roof covering is fragile unless confirmed otherwise by a competent person.

The route to the machine room may not be across a roof but go through a roof space along a narrow duckboard. Again, the potential to inadvertently step off the walkway must be considered and action taken (e.g. duckboard at least 600 mm wide, wider or fully boarded in vulnerable places, provision of handrails) to safeguard against falls through adjacent material.

ACCESS TO MACHINE ROOMS AND SECONDARY LEVELS

Access to and egress from machine rooms and secondary levels frequently involves exposure to heights. Where a person could fall then there would be significant risk to their safety. The Work at Height Regulations imposes specific requirements on the equipment provided for access and egress e.g., Schedule 1 Requirements for existing places of work and means of access or egress at height. The guidelines given earlier on the use of ladders is relevant. EN 81 notes that “when the machine room floor comprises a number of levels differing by more than 0.5m stairways or steps and guards shall be provided”.

Provision of edge protection from falls from secondary levels in lift machine rooms is just as important as protection against falls from the top of lifts. However, this aspect is frequently not recognised and such protection is often overlooked. Do not underestimate the risk of low-level falls when undertaking risk assessments of machine rooms and secondary levels. Many fatal falls at work occur from heights of less than two metres.

Good levels of lighting to allow for safe access and egress are also very important in these situations. An adequate lightening level around plant rooms and equipment is 200 lux at floor level.

ACCESS FOR PEOPLE AND MATERIALS THROUGH TRAPDOORS

Work in the lift and escalator industry frequently requires access and egress for people and material through trapdoors in openings in floors, ceiling and roofs.

Trapdoors are encountered in many situations e.g., access to:

- Bottom drive lift machine rooms [access to these should still be viewed as work at height even though they are located at or below ground level.
- Lift machines positioned over the shaft.
- Sheave and pulley rooms.
- Escalator machinery spaces.
- Roofs; and
- Lift car roofs.

The trapdoors encountered vary in size, weight, opening configuration and will often be positioned in a shared access area such as a stairwell or corridor.

Clearly there exists significant risk to the safety of persons using trapdoors and also those that may be affected by its use.

When accessing trapdoors, the following should be considered: -

- Safe means of access to the trapdoor must be available.
- The trapdoor opening or closing operation should not pose a risk to safety; for upward opening trapdoors a device must be fitted to prevent it falling back and potentially striking someone.
- The trapdoor must be able to withstand the loads that are likely to be imposed on it.
- Trapdoors located in common areas must not be a risk to the safety of others using the area.
- In some cases, when in use, they will need to be identified as a hazardous area and unauthorised persons will need to be prevented from gaining access to them; and
- Whilst on ladders, three points of contact must be maintained (e.g., one hand, two feet)
- Falls, of persons or materials, through the trapdoors when they are in use, e.g., when transferring materials, must be prevented.

Because of likely loads and usage, access ladders to machine rooms should be of the old Industrial Class 1 or 2 (EN131) not Class 3 Domestic (these have red manufacturer's labels) or following the revision of EN131 ladders should Professional class. They must be secured so that they cannot slip. Any hook or bracket used to secure ladders but be regularly examined to ensure its continued security.

Loft type and concertina ladders which slide or fold down have been the cause of many accidents in the past and are rarely capable of taking the weight that substantial loads create. They are rarely of industrial standard. Even when fully extended they tend to slip when a person starts to climb them, resulting in the foot of the ladder moving and frequently trapping the fingers of the climber in the lattice structure and moving parts of the ladder.

Some form of fall protection should be used whilst standing on a ladder. and unlocking a padlock to a hatch which requires it to be held at the same time as using the other hand to operate the key. The use of a harness and short lanyard attached to a suitable anchorage point whilst unlocking the hatch must be considered. It may be worth considering whether the hatch needs to be locked at all, but this may be dependent on its location and the chance of unauthorised access. The ladder itself would not be a suitable anchorage point unless there is no chance of it slipping whatsoever.

When the trapdoor provides access to a machine room it is necessary to be able to close that trapdoor or provide other means to prevent the access of unauthorised persons. Likewise, the potential to step on a closed trapdoor or machinery access hatchway that may not be designed to take the weight needs to be identified and action taken. If it is likely that someone may step onto such surfaces, then a guardrail or chain should be in place. Simply marking such a hatchway with a warning is not sufficient if it is likely that it could be stepped on inadvertently.

Frequently suspended ceilings have been fitted below hatchways into machine rooms. At no time should these suspended ceilings be relied upon to support or steady a person either accessing or leaning through the hatchway. Adequate handholds must be available in these circumstances.

EN 81:20 Clauses 5.2.6 and Annex D details standard for doors and trapdoors and provides a useful standard when undertaking risk assessment.

ACCESS TO BALANCE WEIGHT FROM PIT LEVEL

On traction lifts any work on the counterweight (and indeed the car) that either removes or increases weight has to be carefully planned so that the balance of the car/counterweight is not compromised.

Lift roping / re-roping often requires the balance / counterweight to be positioned near the pit level. The pit floor area is frequently restricted, as is the access for materials / equipment to the lowest levels.

With the balance weight at this level, a means of access to make rope terminations and fit the ropes around diverter sheaves is required.

This work falls within the scope of the Work at Height Regulations so specific arrangements to ensure the safety of all those involved is required.

The Work at Height Regulations requires that we apply the hierarchy of control to introduce the safest procedure. Permanently installed work equipment is not an option and therefore we need to make provision to use other suitable work equipment when necessary. Considering the nature of the work involved i.e. considerable effort is needed, a stable work place is essential.

In practice this requirement can usually be met by the provision of a working platform erected from components that can be relatively and easily transported and used in the limited space available. As stated in the section on ladders, if a ladder is selected, the work should be light in nature and of short duration. Where the use of two hands or the application of force e.g., pulling ropes, using spanners is required to complete the task, the use of a ladder will not be suitable. However, for a simple task such as checking balance weight shoes etc then a ladder may be adequate. So the use of the most suitable work equipment must be determined by risk assessment.

Alternatively access to the balance weight may be achieved at the halfway point and working through the handrail / balustrade or using work restraint (See Appendix A).

ACCESS TO RUPTURE VALVE

Depending on the individual configuration of the lift, the rupture valve will be accessible should it require adjustment or inspection from either: -

- Pit floor

If accessible from the floor, there is no height issue other than that of accessing the pit which is detailed elsewhere.

- At a height above pit floor

If the valve is located at a height above the pit floor, then access equipment will be required. This should be carefully selected as a result of a risk assessment giving consideration to the work to be carried out and the duration of the work.

If a ladder is selected the work should be light in nature and of short duration - so a suitable and stable ladder (or stepladder) might be selected if the valve is to be briefly inspected or adjusted.

However, if the valve is to be removed or replaced, a ladder will not be suitable as the task would involve heavier work for a longer period. In these circumstances a working platform with adequate edge protection is likely to be a better option.

- From the lift car top

If access to the valve is via the car top a risk assessment should give consideration to any fall hazards / voids which may exist around the car and any existing fall protection measures in place (such as a balustrade around the car top). How the work is to be carried out must also be considered. If it involves leaning out over the balustrade then additional measures may be required – for example personal fall prevention such as work restraint.

- Where the use of two hands or the application of force is required to complete the task the use of a ladder **will not** be suitable.

ACCESS TO LIFT CONTROLLER ON MACHINE ROOM LESS LIFTS.

On many modern machine-room-less installations access to the lift controller is achieved from the upper most landing. Such designs achieve the objective of the Work at Height regulations as there is no working at height involved. Where the controller is located inside the shaft, access is achieved by working from on top of the lift car. As such lifts are a fairly modern innovation, they will be designed to EN81 standards and should have the requisite handrails if fall hazards over 300mm are present on top of the car.

CLEANING OF GLASS LIFT WELLS

Persons employed in the cleaning of lift wells will not necessarily be lift engineers. It is therefore essential that a suitably competent person e.g., a lift engineer is present at all times during the cleaning operations where it is necessary to gain access to the lift shaft or operate the lift car under maintenance conditions.

Reference should be made to any manufacturers or owner's documentation as this may contain information on cleaning the unit.

Prior to commencing any glass cleaning works from the lift car top, a suitable and sufficient risk assessment must be completed to include verification that:

- Access to the car can be safely achieved and maintained,
- The car top controls are identified and are compliant with current industry standards
- The safety circuit has/will be checked
- If fall hazards are evident and no handrails are fitted that a suitable anchor point for a work restraint lanyard must be identified.
- If restricted headroom is evident then control measures are required.
- Any obstructions in the lift well have been identified particularly on partially enclosed lifts.

Cleaning should only be carried out with the lift car stationary and the "stop" switch activated. It may be necessary to lock and tag out the equipment.

During the risk assessment process, consideration should be given by the cleaning contractor as to what type of cleaning equipment is to be used. For example, the use of telescopic cleaning equipment will reduce the need to lean towards the glass and allow a larger surface area to be cleaned without the need for moving the lift.

The lift well should be cleaned from the top down and therefore reduce the risk of the lift engineer and cleaning contractor coming into contact with lift equipment or fixed objects located in the lift well. The use of work platforms or ladders in the pit or shaft should only be considered if the unit has been switched off and locked and tagged out. Such cleaning should only be carried out by specialist contractors familiar with this type of work.

WORKING ON ESCALATORS

FRAGILE SURFACES ON ESCALATORS

Balustrades on or adjoining escalators / walkways are frequently constructed from safety glass, however it is possible that these have been designed to take a load only in a particular direction. If a force is applied in an unplanned direction, then it is possible for the balustrade to break. Account of such forces should be made when planning the work. e.g., when placing a ladder against the equipment for cleaning or when maintenance may be necessary.

FALLS FROM HEIGHT WHILST WORKING ON ESCALATORS

Working on escalators at the top or on the steps [other than from the bottom landing] should be deemed work at height and precautions taken so that a fall that could result in an injury cannot occur. During the construction stage if the balustrades are not fitted then clearly there is the potential for falling and action must be taken to address this risk. Even when the balustrades are fitted other than walking up and down the escalator, work on the escalator should satisfy the requirements of the Work at Height Regulations.

Some designs of escalators have separate machinery spaces and in specific instances the truss interior needs to be accessed from the floor of the machinery space. The introduction of the Work at Height Regulations has implications for these activities.

There are three distinct requirements to be addressed: -

- Access to and egress from the truss when the height, in the event of a fall could result in injury. Similar to lift pit access, there should be adequate hand and foot holds to allow safe access and egress into the truss.
- The provision of a safe place of work at height that provides protection against the fall of persons and materials both over the balustrades or down the escalator.
- The protection of those working or having access below where others are working, whose safety is at risk from falling objects or materials.

Escalator installations are frequently located in areas where their exterior enclosures form architectural features within the premises. Naturally these exterior surfaces are likely to require cleaning and maintenance. These activities fall within the scope of the Work at Height Regulations and compliance is essential.

CLEANING OF ESCALATOR BALUSTRADES

During the cleaning of the external balustrades, the cleaning operative should not be required to lean over the edge to an extent that they could fall. If this is a potential risk then the cleaning equipment should be telescopic and angled to enable cleaning from a safe position.

The risk assessment should give consideration to the use of mobile elevated working platforms (MEWP's) operated by trained competent persons or the assembly of scaffold to clean the outside balustrades of escalators. Scaffold must **not** be supported on the step band or balustrade of an escalator or conveyor without verification that the location will take the point loading..

Reference should be made to any manufacturers or owner's documentation held in relation to the maintenance of the escalator prior to cleaning as this may contain information on cleaning the unit.

Prior to cleaning escalator balustrades the unit should be isolated (with key) and locked and tagged out.

Suitable barriers should be placed around the top and bottom access points to prevent any unintended movement and access by unauthorised persons.

The floor area directly adjacent to the balustrades should be demarcated as an Exclusion Zone and suitably cordoned off, so that in the event of cleaning tools being dropped no one can be injured. If this cannot be achieved then

cleaning tools should be secured to prevent them falling e.g. by the use of tool lanyards or the work undertaken outside normal hours.

SMALL GOODS LIFTS

On many small goods lifts access and work within the machine compartment will involve work at height.

Because of the site restrictions, in many cases the means of access may involve using a ladder. Ladders are only suitable for light work of a short duration. For heavy work or for work of a prolonged duration a ladder is unlikely to be suitable work equipment.

A risk assessment must be carried out to determine the most suitable equipment to use and consideration needs to be given to the task to be carried out, the duration of the work, the possible distance a person might fall and any additional risk which a person might face – such as moving machinery, falling onto glass or hot surfaces.

It is not uncommon to find standard step ladders are often provided by the client for machine access to small goods lifts. Except where they are specifically designed for access, step ladders are not suitable for this purpose as they usually need to be placed side on to the access point and can easily move sideways, caused by persons attempting to step off them near the top to gain access to the machine.

If the decision is made to use a ladder then it must be strong enough, rest on a level stable surface and be prevented from slipping. They should be of the industrial type and modified to incorporate hooks and eyes or other means of securing them into position. Such ladders should be stored safely and securely adjacent to the lift installation.

A secure handhold must always be available to the user – so the top three steps or rungs must not be used.

Special attention should be given where ladders are used in busy locations especially behind doors where others can easily collide with the ladder. The use of ladders in these circumstances may require the closing of passageways to reduce this risk and any such decision must take into account any effect on providing safe escape routes in the event of an emergency.

If access to machine compartments can only be achieved by standing on top of a goods lift then the risk assessment must ensure that the roof of the lift is of adequate strength. The lift must also be fitted with a functioning safety device or another device that will prevent downward movement of the car when it has been positioned for the purpose of providing access to the machinery and is thus being used as a working platform. The risk assessment should also take account of the total working load of engineer / inspector plus material on top of the lift and ensure that this does not exceed the SWL of the lift.

STAIRLIFTS

Work on stairs is covered by the Work at Height Regulations; therefore if it is possible to avoid the work by carrying it out at the foot rather than the top of the stairs then this is the preferred option.

Where the work cannot be carried out at the foot of the stairs then an assessment should be made of the stairs and floor coverings including the use of dustsheets, and other protective coverings. These may require securing to avoid tripping or slipping hazards.

The assessment must also consider the possibility of falls through low windows. Household effects and features may increase the risk of harm should a fall occur and action taken to remove or reduce the risk.

When work is in progress it is essential that tripping hazards are not created by tools, packaging and other equipment and whenever possible tools and equipment must not be left on the stairs or where they may be tripped over.

Other people may have to be excluded from the building or from the working area whilst work is in progress.

LOADING and UNLOADING VANS and LORRIES

Accessing tops of vans

A significant number of lift and escalator engineers are provided with vehicles, these are usually car derived vans or panel vans (higher roof) frequently fitted with roof racks to transport larger items that may not fit within the vehicle.

A vehicle fitted with a roof rack should be checked regularly to ensure that fixings securing the roof rack are secure.

Whenever possible equipment should be transported within the vehicle as this removes the necessity to access the vehicle's roof. If this is not possible make sure that the load is not too heavy for the vehicle or its roof and roof rack.

Accessing the vehicle roof rack to place and secure a load should be carried out from a suitable and stable ladder. The driver/passenger and/or rear door cill in most cases does not create a safe position to apply the necessary force to secure the load. Ideally a purpose made ladder should be fitted on the rear doors of panel van to provide access.

Never climb on top of a vehicle unless an access ladder is used, and the top of the vehicle has adequate protection to prevent persons falling from it. Most lift company vehicles will not have such protection.

Ideally the vehicle should be parked on a level surface away from other traffic with the engine turned off and the handbrake applied.

Always ensure adequate illumination is available in the working area when placing and securing a load to the roof rack and do not attempt to move materials on the vehicle in poor weather conditions.

Loading and Unloading of Lorries

The following are the main fall hazards associated with loading and unloading lorries:

- Climbing up onto or jumping down or falling from flatbed/loads
- Loads collapsing / moving knocking people from the vehicle
- Overloading
- Untrained personnel

The need for loading and unloading lorries particularly during installation and modernisation work is a fundamental operation and although frequently overlooked as part of the lift and escalator work it must be given the highest consideration during the early planning stage.

Clients, Principal Contractors and those in control of sites must recognise that they play a significant role in ensuring safe systems of loading/unloading and the provision of safe storage facilities. The practice of leaving the "problem" to be managed by the contractor must be avoided when good planning and design considerations can be used to benefit the management of good working practices.

Early identification of traffic management, holding areas and loading / unloading facilities must be established throughout what is acknowledged as an operation with the potential for serious or fatal injury.

All workplace activities need to have risk assessments carried out prior to the work commencing. The loading and unloading of lorries in most cases is deemed a routine operation, however due to the high number of serious injuries associated with loading and unloading it is necessary to ensure that every operation is assessed for any abnormal or unusual conditions prior to the work commencing.

If abnormal or unusual conditions are found, then a task specific risk assessment will be required to ensure the safety of those involved in the operation is considered in specific detail to eliminate/reduce the unexpected from happening.

The risk assessment should be used to develop the safe systems of work, which should remove or reduce the risks identified. Detailed work instructions may be needed to address any residual risks that exist following the introduction of the control measures.

If the safe system of work requires the use of additional PPE such as a body harness and lanyard for use as a fall restraint, then clearly consideration must be given to the anchorage point and the ability to take prompt action should be necessary to move quickly on the flat bed of the lorry should a fall of material occur.

The use of “competent personnel” is paramount for loading and unloading of trailers. Many lift and escalator companies clearly instruct their personnel that they should not get involved with the unloading of equipment and clearly rely on the driver/crane driver and where necessary banksman. If this is the case, then all involved should be clear of this instruction otherwise those not aware may expect intervention from persons who should not be playing any part in the operation

If the employer permits its employees to unload vehicles, then they must assess the ability of the personnel chosen to load and unload materials as it is all too common for injuries to be sustained following a “keen pair of hands” having climbed on board to assist. Safety induction training must highlight that only trained personnel are authorised to carry out such work.

One of the more frequent causes of injury is personnel becoming trapped or crushed between the material being loaded or unloaded. Great emphasis must be made by all those involved in the work to ensure that loads have not shifted in transit or lifts commenced until all personnel are in a “position of safety”. That is a location identified by the operatives that should something go wrong does not place them where they can be harmed. This is not just for the positioning of the whole body but includes the hands and arms etc that can be injured during the loading or offloading operation.

Physical edge protection on lorries is frequently difficult but should be in place wherever practicable.

A fall from the platform/bed of a lorry can result in a fatal or serious injury, either due to the person landing on materials or the solid surface or falling materials landing on top them.

Palletised or large loads that can be loaded or unloaded by use of a forklift truck will greatly reduce the risk to personnel as limited or no access onto the lorry will be necessary in most cases.

In cases where access onto the lorry is necessary, the operatives should have means of access as close to their work position as possible, ideally by provision of a ladder secured in place. Their work position should be at the end of the load and not in the centre, and in all cases in a location where they can make a step away to a safe place if control of the load is lost.

Climbing upon the load must be avoided, and the use of ladders to access the load should only be considered in strictly controlled conditions and following a safe system of work.

Cab access/egress

Vehicle cab heights continue to increase, and it is vital that drivers follow good practice to minimise the possibility of a fall from height.

- Use steps provided
- Use grab handles to assist, not the steering wheel
- Before egress visually check the ground for obstructions
- Do not jump out of the cab
- Exit the cab backwards

Working on platform vehicles and trailers

Where the necessity to get onto these vehicles cannot be avoided and other restraint or protection systems are not appropriate then other measures should be considered. These should include:

- Suitable hand holds and steps to allow easy mounting and dismounting to the platform
- Trip guards along the platform edge
- Ensuring the platform is kept clear of rubbish and the floor is secure and in good condition
- Ensuring work areas are well lit
- Taking account of weather conditions
- Ensuring that work equipment is well maintained that any damage or excessive wear is reported, and that this results in suitable action to manage risks
- Workers should avoid walking backwards at all times
- No-one should jump from a vehicle or load

Articulated vehicles

Where there is a need to connect air lines and electrical supplies between the tractor and trailer then suitable provision should be made to protect the driver from falls. These may be suitable steps and hand holds.

(Extracts of this information is with acknowledgement to the Freight Transport Association and the HSE)

FALLING OBJECTS and MATERIALS

The Work at Height Regulations makes it quite clear that steps must be taken to prevent the fall of any material or object. It also forbids the throwing or tipping of objects from height where this might cause injury and deals with the storage of material or objects such that unintended movement of the material cannot occur. Also, action must be taken to prevent unauthorised entry to areas where there is a danger from falling from height or being struck by a falling object.

Where it is not reasonably practicable to take suitable steps to prevent the fall of material or objects, then action must be taken to prevent people being struck by the falling material or object.

On construction and modernisation sites where lift personnel are at particular risk from materials and objects either falling or being thrown down lift shafts action must be taken. On these sites landing entrance protection needs to be in place before work in the lift shaft and pit commences.

The provision of top and mid scaffold rails and toe boards across the landing entrance is not considered sufficient protection against the fall of objects down the shaft. At the very least, mesh netting should be fixed over the whole entrance to stop the fall of materials and objects. Although essential to protect those working in the shaft the netting should not inhibit the access / egress of personnel and material and requires strict discipline to replace it every time so that it remains effective.

The most effective protection against falls is full height guarding of the lift void at each level. This also achieves the requirements of Regulation 11 [a], i.e., where a workplace contains an area in which owing to the nature of the work, there is a risk of any person at work falling a distance which is liable to cause personal injury, then the workplace is equipped with devices to prevent, so far as reasonably practicable, unauthorised persons from entering.

Ideally entrance protection should be solid or mesh structure of sufficient strength to protect anyone falling against it and stop objects and materials falling or being thrown down the shaft. If a mesh steel design is used, then it should consist of a toe board to stop objects being kicked or swept underneath it. The provision of a structure fitted with lockable doors / gates at each level facilitates control of access / egress to the shaft. In some designs outer full height and inner stable doors have been included in the design. The use of different locks permits access to the shaft from the landing without access into the shaft and thus stops exposure to the fall hazard. This is particularly useful for tasks that can be safely undertaken from the landing without exposure to the fall hazard in the shaft e.g., paint spraying of the shaft before installation of the lift commences. Where temporary hoardings are provided to protect exposed landing openings, guard-rails, mid-rails and toe-boards should be erected within the hoarding, across each landing opening (see BS7255:2012 E.3.2).

Where possible landing protection should remain in place until the landing entrance assembly is complete with the lift doors capable of being locked from the inside.

When working in the shaft, both on construction or client sites, it is not considered safe practice for one person to be directly above another unless it is absolutely essential for the work to take place e.g., hoisting and fixing guide rails. In such situations, protection e.g., netting / scaffold boards should be in place so that any fall of material does not injure the person working below. Full floor lift decking during construction [see section on scaffolding] with protected up stands provides very good protection from falling material.

Where lifts share a common shaft and no full height division screens are fitted then any work on lift cars in adjoining shafts should be conducted with the cars positioned at the same level so that objects cannot fall onto adjoining lifts.

On Observation / Wall-climber type lifts which are not fully enclosed, precautions must be taken to stop the fall of objects and materials. On lifts which are being installed this may require full-length netting down the shaft or area to contain any falling objects etc. On lifts under service, precautions can include using tools with lanyards either tethering them to the wrist or a suitable anchorage point; the use of magnetic trays to contain fastenings; restricting the time of day so that any atrium areas are clear of people or providing a barriered area around the bottom of the shaft to prevent the public from gaining access close to the area of work. Tools can be fitted with split rings to aid the fastening to lanyards.

When assessing the potential for falling objects, account should be taken of the possibility of small objects falling through gaps in working platforms; small objects falling through mesh decking [e.g., coins falling from pockets when opening machine rooms doors], as well as off the side of workplaces.

SCAFFOLDING

The legal requirements for scaffolding are contained in the schedule for the Work at Height Regulations.

Much lift and escalator work has to be carried out from scaffolding or suspended platforms. It is important that the structure is sufficiently strong and secure, that adequate guardrails are in place on all edges where a fall could occur. It is essential that safe working practices are operated at all times.

Scaffolding and other working platforms must be erected by trained specialists, and when in use should be inspected weekly or whenever significant alterations are made by authorised personnel and a record maintained.

Whenever working from any type of raised platform edge protection should be fitted with top rails 950 mm high together with mid rails and toe boards so that no gap is greater than 470mm.

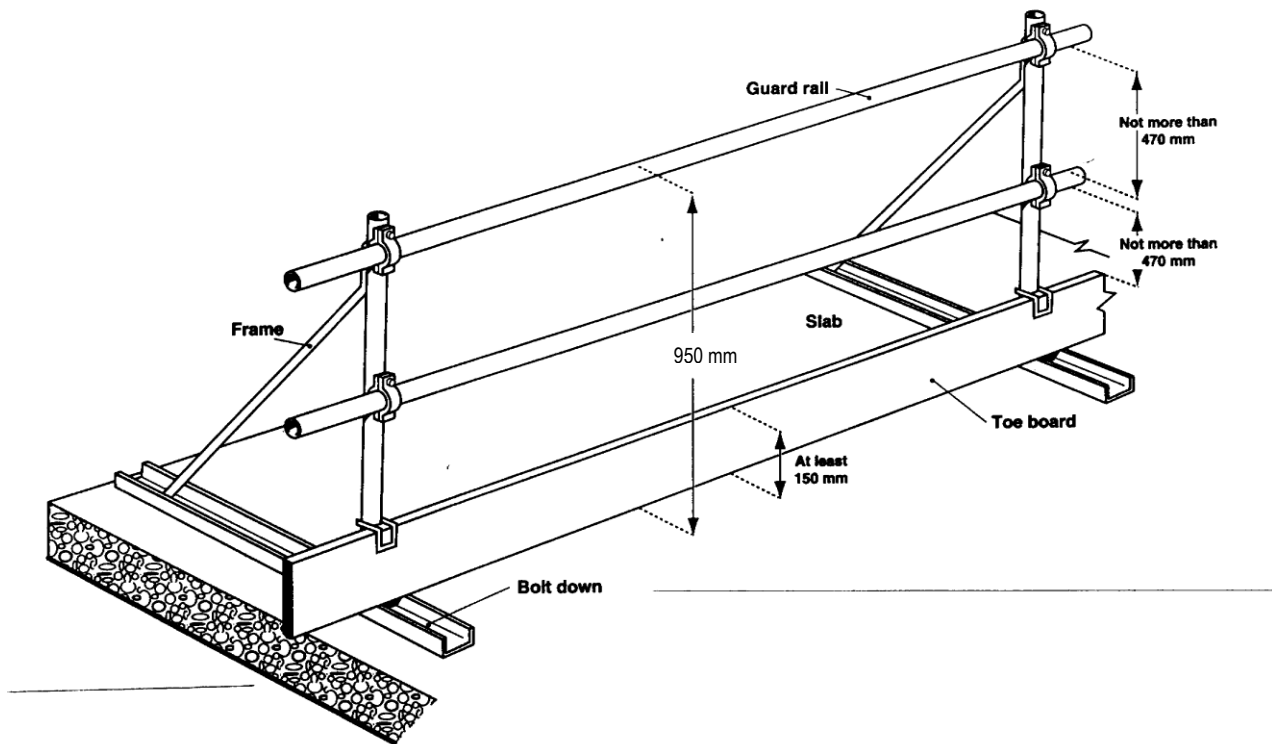
Tools and materials should be kept in a safe and tidy manner so that they cannot fall.

Accidents often occur because scaffold boards are wrongly placed or are removed. So, whenever you need to use a scaffold, first check that:

- Boards are secure
- The platforms are at least 600mm wide
- The correct thickness boards are used for the support span provided by the scaffold tubes - 32mm boards can span up to one metre; 38mm boards can span up to 1.5m; 50mm boards can span up to 2.6m
- The boards are straight, in good condition and free of splits and large knots
- The boards do not project more than four times their thickness beyond the last support.

You should also check that:

- Toe boards intermediate and guard rails are in place
- Gangways are not obstructed by tools or materials
- The scaffolding provides safe working platforms everywhere they are required, allowing free access to all work areas without overreaching



Although satisfying the legal minimum the use of such scaffolding for lift shaft entrances is not recommended as it creates access problems and limited protection from falling objects. The provision of full height protection with lockable doors and gates as detailed is recommended in the Falling Objects and Materials section.

- Safe access to the platforms is provided ideally via built-in steps or by ladders which have been secured to the scaffold members
- Scaffold flooring is not slippery or overloaded
- There is sufficient lighting wherever you need to work.

Note that scaffolding will have been erected for safe working, in line with strict regulations. *Under no circumstances should lift engineers attempt to move any scaffold clamp, or tube unless they are trained and authorised.* If any part of the scaffolding is likely to obstruct work, it must be altered by a scaffolder so that it can be changed safely.

When working from a scaffold in a lift shaft, clear spaces will be left down the full length of the well to allow the installation of equipment such as the lift guides. As these spaces present a particular hazard, make sure that:

- All platforms must be fully boarded except for any internal stairway / ladders
- The boards cannot move, they must be secured by a competent person.
- Guard rails, intermediate rails and toe boards are fitted, not just to the working platforms
 - Any open lift entrances action is taken to prevent people and materials falling through. See section on Falling Objects and Materials.

An alternative to conventional scaffold is the use of decking systems, which uses boards cut to size to fit the shaft with minimal gaps and apertures which are fitted with upstands to stop objects falling down the shaft. The boards are then fixed to supporting structures to create a stable and flat working platform of adequate strength to take the loads. Such systems should be purpose made and comply with the requirements of relevant Schedules of the regulations.

MOBILE AND TOWER SCAFFOLDING

Mobile and Tower scaffolding must be erected, altered and dismantled by authorised and competent persons in accordance with the manufacturer's and / or supplier's instructions. Towers should be erected following a safe method of work. There are two approved methods recommended by the Prefabricated Access Suppliers' and Manufacturers' Association (PASMA), which have been developed in co-operation with the Health and Safety Executive. See HSE information <https://www.hse.gov.uk/construction/safetytopics/scaffold.htm>

It is strongly recommended that mobile tower scaffolds that are compliant to BS EN 1004-1:2020 Mobile access and working towers made of prefabricated elements – Materials, dimensions, design loads, safety and performance requirements are used for the following reasons.

- They have purpose designed platforms with safe trapdoor entry and exit
- Have built in access for safe ascent and descent
- They are supplied with the correct size and quantity of stabilisers to prevent overturning. The stability requirements of mobile tower scaffolding relating to height to base ratios must be in accordance with guidance provided by individual manufacturers.
- Have the correct quantity and number of guardrails with the correct gaps and dimensions to prevent a fall

Before you use mobile scaffolding:

- Check that all parts are in good condition, looking particularly for damaged feet and cracked or bent connection tubes and pins.
- Position the scaffold so that work can be easily performed from the platform, without having to reach beyond the edge of the scaffold. If the work involves pushing hard sideways (as when drilling, for instance) it must be secure to the structure to stop movement.
- If a mobile scaffold has to be moved, reduce the height to a maximum of 4m taking care that it does not topple; check there are no obstructions overhead and never move a scaffold tower with anyone or anything on it.
- Make sure the scaffold feet are level and resting on a firm surface, do not position castors on boards or other material which may conceal voids below. If castors are used, these must be locked in position before using the scaffold.

The scaffold should be equipped with access stairs or access ladders; otherwise access and egress to each level should be achieved via the lift landing. Ideally these entrances should be protected by full height hoardings provided with a purpose made door or gate, which is lockable.

INSPECTION OF SCAFFOLDING

Mobile towers must be inspected by competent persons.

If the working platform is less than 2m in height it must be inspected:

- after assembly in any position
- after any event liable to have affected its stability; and
- at suitable intervals depending upon frequency and conditions of use

If the working platform is 2m or more in height it must be inspected:

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

An inspection is not required every time the tower is moved but where any movement has required the removal of components (to pass an obstruction for instance) then a pre-user check is required by a competent person.

For towers of 2m or more in height and where the inspection is carried out after the assembly or to comply with the seven-day requirement the competent person must complete an inspection report by the end of the working period. The report must be presented to the person on whose behalf the tower was erected within 24 hours.

The record must be kept by that person on the site it was carried out or until the work is completed and then for 3 months after in a safe place.

MOBILE WORKING PLATFORMS AND FALSE CARS

These are used primarily during the installation and modernisation of lifts. They can either be specially constructed platforms or use the lift car sling and platform. Movement is either achieved from using the lift power source or use lifting hoists to move up and down the shaft.

In terms of working at heights two issues must be considered: -

- Falls from the platform edge
- Failure of the lifting devices [e.g., motor, ropes etc] leading to uncontrolled decent of the platform.

The requirements of Working Platforms are detailed in Part 1 of Schedule 3.

These include the requirements that they must be: -

Suitable and of sufficient strength and rigidity for the purpose for which it is being used

Sufficient dimensions for: -

- Safe passage of persons
- Safe use
- Possess no gaps through which a person or any material or object could fall

Be so erected, used and maintained in such condition, as to prevent, so far as reasonably practicable: -

- The risk of slipping or tripping or
- Any person being caught between the working platform and any adjacent structure.

Normally the sites where the use of mobile working platforms and false cars take place will be a construction site and as such the requirements of Schedule 2 [3] of the Work at Height Regulations will apply. This requires that guard-rails constructed to protect against falls have their top rail 950mm above the edge together with suitable toe boards and intermediate guard-rails positioned so that any gap does not exceed 470mm. The design of mobile working platforms and false cars should provide at least this level of protection from any edge where a person could fall.

Mobile working platforms and false cars should only be constructed, used, altered and dismantled by trained and competent people.

Platforms are fitted with devices that stop the uncontrolled decent of the platform. Due to the harsh environment in which these platforms may be used any safety device should be tested for correct function at the start of every work period.

Likewise, an inspection of the platform and auxiliary devices should be conducted at the start of each work period to ensure that the platform remains safe to use. Records should be kept of these inspections.

During their operation of the platform Safe Working Loads must not be exceeded and work planning needs to take account of this.

COMPANY PREMISES - Offices and Stores

Offices and stores frequently carry out activities where there is a possibility of people, or material or objects falling. This may include access to storage shelves, racking, or storage areas on mezzanine floors.

Where the safety of people is at risk from these activities the Work at Height Regulations apply just as they would on a construction site, factory, or any other workplace.

In general terms the risks should be controlled by:

- Securing objects or materials or arranging them in such a way so they cannot fall.
- Providing safe means of access to the objects or materials.
- Ensuring that people doing the work are competent; and
- Keeping people clear of areas where material or objects are likely to fall.

Equipment and plant contained within offices and stores will require maintenance, repair and replacement. It is the duty of the persons in charge of the premises to ensure that these activities are carried out in compliance with the regulations. In many cases this will involve co-operation with contractors selected for their ability to do the specific work.

Ladders to access storage racks may not be the most appropriate work equipment. Mobile access stairs with the provision of a handrail and working platform at the top may be more appropriate if space allows.

Edge protection should be provided on mezzanine floors, and this may be designed to facilitate the passage of materials. However, such guarding should be replaced immediately after the passage of such materials and at no time should anyone be exposed to falls by its removal.

A plan for any work at height, needs to be produced. This plan should be preceded by an assessment of the specific activities for each premise so that safe systems of work can be operated.

When new premises or facilities are being designed / planned then the requirements for safe working at heights should be provided using the opportunity to eliminate risk at source.

APPENDIX A

THE USE OF COLLECTIVE AND PERSONAL FALL PROTECTION SYSTEMS

The Work at Height Regulations 2005 only allows the use of fall protection systems when it is not possible to prevent a fall by some other means e.g., by the use of collective protection measures such as the use of guard rails, barriers or working platforms.

The fall protection systems are subdivided into

- those offering collective protection such as nets or airbags and
- those providing only personal protection such as work restraint or fall arrest lanyards used in conjunction with a full body harness.

COLLECTIVE MEASURES

In the lift and escalator industry collective fall protection systems such as nets and airbags may only have a limited application, but it must not be overlooked.

The regulations require that when using collective fall arrest facilities, it is essential that:

- A risk assessment has shown that the work can be performed safely without affecting its effectiveness.
- The use of other safer work equipment is not practical.
- Sufficient people have been trained in its specific use and that the training includes rescue procedures.
- It is of sufficient strength to safely arrest a fall.
- Any fixings required shall support the load in arresting the fall and during any subsequent rescue
- It must be stable.
- If it distorts in arresting a fall, then there should be sufficient clearance; and
- It does not itself cause injury to the person falling.

To meet the above criteria the lift and escalator industry would need to consider the following points:

- The size limitations restrictions for fitting such equipment imposed by lift shafts.
- Provision of rescue facilities on all occasions.
- Obstructions liable to cause injury to free fall due to equipment installed in lift shafts e.g., scaffolding, guide brackets, vanes etc.
- The relatively short duration of time that the equipment would be in place.
- The absence of suitable attachment points in typical escalator/moving walk structural openings; and.
- It is both reasonable and practical to use a fall prevention system.

Consideration could be given to whether nets can be fitted into a lift shaft, or the shaft fully boarded to regular levels to stop falls. Likewise, whilst it may not be possible to erect nets across escalator voids due to the actual passage of the escalator when it may be possible to use air bags under where engineers are working.

However, considering the physical restrictions in lift shafts and escalators voids it is considered unlikely that collective fall arrest systems can be applied to many of our industry's work activities.

PERSONAL FALL PROTECTION

If it is not possible to protect against falling by utilising any of the foregoing solutions and a fall hazard exists, then personal protective equipment needs to be considered.

Any personal fall protection must only be used if a risk assessment has shown that: -

- The work can be performed safely while using that system.

- The use of other safer work equipment is not reasonably practicable.
- Sufficient people have been trained in its specific use and that the training includes rescue procedures.

The Regulations require that a personal fall protection system shall only be used: -

- It is of sufficient strength for the purposes having regard to the work being carried out and any foreseeable loading.
- Where necessary, fit the user.
- Is correctly fitted.
- It is designed to minimise user injury and adjusted to prevent the user slipping or falling from it in the event of a fall.
- Be designed, installed, and used as to prevent unplanned or uncontrolled movement of the user.
- When designed to be used with an anchor it shall be securely attached to at least one anchor and each anchor shall be of suitable strength and stability to support any foreseeable loading.
- Suitable and sufficient steps are taken to prevent a person falling or slipping from it.

If personal protective equipment is selected it should be very much a last resort, then preference must be given to **work restraint** (sometimes called work tethering). This is where the worker wears a harness attached by a lanyard, which is of such a length, that it prevents the person from reaching the fall hazard. If the lanyard is of an adjustable nature, then this requires very strict discipline by the wearer, and enforcement by supervision, so that it is always adjusted to stop the person reaching the fall zone.

Part 5 of Schedule 5 states that a work restraint system shall: -

- Be so designed that, if used correctly, it prevents the user from getting into a position in which a fall can occur and
- Be used correctly.

Work restraint systems when properly designed and worn must prevent falls from occurring.

Examples of where it may be appropriate to use of work restraint systems include: -

- The initial installation of edge protection e.g., at structural openings, lift landings, on top of lift cars and where escalator balustrades require fitting.
- When work areas are being surveyed for the provision of collective fall prevention such as handrails.

The essential criteria is that the wearer cannot reach the fall hazard. It is unlikely that the use of work restraint systems would be acceptable as a permanent solution to fall prevention in an area that required regular access or the presence of a variety of personnel e.g., access to the lift car top by maintenance and inspection personnel.

The work restraint systems offers protection from falls only to individuals and therefore would not be selected in preference to the use of guard-rails, barriers, or working platforms that offer collective fall prevention.

If work restraint is not practical because the person needs to work adjacent to the fall hazard, then some form of temporary barrier should be considered in preference to the wearing of fall arrest equipment. Only where no other protection system, either collective [e.g., nets] or personal is practical should fall arrest equipment be considered.

Personal fall arrest system consists of a full body harness and lanyard including an energy-absorbing device to limit the forces exerted on the body should a fall arrest take place. The intention of the system is to stop collision of the user with the ground or structure.

Part 4 of Schedule 5 of the Work at Height Regulations requires that a fall arrest system shall

- Incorporate a suitable means of absorbing energy and limiting the forces applied to the user's body.

And it shall not be used in a manner: -

- Involving a risk of the line being cut.
- Where its safe use requires a clear zone, allowing for any pendulum effect, which does not afford such zone or
- Which otherwise inhibits its performance or renders its use unsafe.

Thus, on many situations where fall arrest equipment has previously been used, e.g. on scaffolding, on top of lift cars, the lack of a clear zone in which the person would fall does not meet the legal requirement. Clearly a fallen person would impact the scaffolding or the side of the lift car or shaft structure. In addition, on top of a lift car there is a significant risk that the lanyard could be cut.

However, in some situations where there is a clear fall zone e.g. when guardrails are removed for the passage of an escalator during installation then fall arrest may be appropriate. This can only be determined as the result of a risk assessment taking account of the hierarchy contained within the regulations.

If fall arrest equipment is selected, then account must be taken of the distance the person will fall before being arrested. Using this equipment at low level may not give sufficient distance for a fall to be arrested before contact is made with the pit floor etc.

Whatever fall protection system is chosen the anchorage point to which a lanyard is attached must be carefully considered to ensure that it has sufficient strength to take the load, should a fall or trip occur. The anchorage point should ideally be as high as possible so as to limit the distance of a fall. This is especially important for fall arrest equipment especially for inertia devices to work effectively. Low anchorage points reduce the effectiveness of this equipment to arrest a fall and if an inertia reel is being used then many will not function due to being below the wearer.

It is not considered good practice to attach fall protection equipment, either as a restraint or arrest, to the lift shaft structure if the lift is likely to be moved. However, if this is the only suitable anchorage point available then the lift must be locked and tagged out before attaching the lanyard to the lift shaft structure. As an alternative, lifelines fixed above where the person is working can be used. (See LEIA Safety Instruction Sheet 22 - Fall Protection).

If the lift car needs to be moved and it requires a person on top of the car to move it, then they must take up a central position, away from the fall hazard, and ensure their fall protection equipment does not present a hazard of snagging on items in the shaft e.g. vanes, brackets etc. Car top controls should not be positioned adjacent to unprotected fall hazards. If they are then action must be taken to protect against the fall hazard.

Because work restraint system prevents a fall from occurring, they should always be considered in preference to the use of fall arrest systems.

RESCUE/RECOVERY OF FALLEN PERSON – SUSPENSION TRAUMA

Should a fall occur it is important that recovery of the person is undertaken promptly especially if the person is injured or unconscious so that they cannot move. If someone is left hanging motionless in a harness, then a phenomenon known as suspension syncope (or suspension trauma) can occur. This is caused by a number of factors but particularly the harness restricting the blood circulation, which ultimately affects vital organs such as the brain heart and kidneys. It can be exacerbated by other factors such as shock or injury caused by the fall itself. Loss of consciousness can occur within six minutes to two hours. Death may result from the suspension trauma itself or incorrect recovery of the fallen person.

It is therefore essential that whenever fall protection equipment is worn, thought and planning has been given to how safe rescue will be achieved.

The planning may include: -

- Emergency and rescue procedure including availability of rescue equipment
- Can a timely rescue be achieved?
- Will trained and competent people be in the location?
- Are there suitable arrangements in place to administer rescue and / or first aid procedures in the event that an injury may occur?
- The Emergency Services cannot be relied upon as being available to provide timely rescue.

All persons involved must be made aware of suspension trauma phenomenon and the need for prompt recovery.

It is essential that the alarm is raised immediately should a fall occur so that the rescue plan can be put into action immediately. If access to the fallen person can be achieved from an existing workplace e.g., adjacent scaffold platform then this may be the quickest and safest means. However, if the person is hanging in a free fall zone, recovery back to the workplace will be difficult without mechanical advantage.

Various rescue devices, which can be attached to the fallen person, exist. Rescue techniques must be planned and practised so that speedy and safe recovery of the fallen person is achieved.

Due to delays in raising the alarm if a fall occurs when working alone, the use of fall arrest equipment during single man working is not recommended. It is the industry's view that where single man working is conducted then collective fall prevention measures, detailed above to protect the person from the fall hazard must be in place.

APPENDIX B

EXPLANATION OF THE WORK AT HEIGHT REGULATIONS 2005

Attention is drawn to the following HSE information to explain the Work at Height Regulations.

<https://www.hse.gov.uk/pubns/indg401.htm>