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## **GUIDANCE NOTES - PREFABRICATED ALUMINIUM SCAFFOLDING**

### **STABILITY**

One of the main reasons for selecting aluminium alloy towers is for their lightness and ease of assembly. Due to this lightness care must be taken to ensure the stability of the structure. The manual that accompanies the components provided by the supplier would show the safe height to which the various tower configurations can be erected.

The usual rule of thumb for height to base ratio of 3x base dimensions for external use or 3.5x for internal use can no longer be safely applied as tests and calculations have shown that tower structures perform in different ways. Reference should be made to the various suppliers' assembly instructions that will show the quantities of material required for each height of tower, and the stabiliser requirements. As a general rule stabilisers or outriggers will be required once a tower has been built beyond its first frame level.

Wind affects the stability of a tower by imposing a horizontal load onto the tower, which in turn may cause it to overturn. During normal safe working conditions this tendency is counteracted by the weight of the tower and the effect of the outriggers or stabilisers.

BS 1139 Part 3 1994 (HD1004) states that a tower must be stable in a free-standing condition in a wind pressure that equates to 28mph (Beaufort force 6). If the wind speed exceeds 17mph work should cease upon the tower and it should be tied into a rigid structure before work recommences upon the tower. If the wind speed is likely to reach 40mph the tower should be dismantled.

### **SAFE LOADING**

Generally the manufacturer's instructions will give the safe working load that can be placed on any platform, the safe working load that can be placed on the tower as a whole and the safe working load on the castors. The castors will have this loading marked upon them. It is recommended that the maximum design load be displayed at the base of the tower for the information of all users.

Any load hoisted onto the tower must be within the effective base dimensions of the tower. Attempting to hoist a load outside the base area may cause it to overturn. Advice must be gained from the suppliers before hoisting loads to ensure the safe and stable use of the tower.

### **MEANS OF ACCESS**

Access to the platform must be provided by integral/vertical ladders, stair ladders, inclined ladders or stairways. These should be erected in accordance with the supplier's instructions. Where there is frequent movement on or off the tower or materials carried then a stairway should be used. External ladders must never be used.

Where access is through a fully decked platform this must be via a hatch in the platform that is capable of being secured in the closed position. The minimum size of the hatch must be 400 x 600mm.

## **MOVING**

1. Towers are never to be moved with men or materials on the platform and are only to be moved by applying force at or near the base of the tower.
2. All holes, ducts, pits or gratings near the tower, are to be securely covered prior to movement being carried out.
3. If towers fitted with outriggers are to be moved regularly, it is advisable that the outriggers should also be fitted with castors.

## **CANTILEVER PLATFORMS**

Towers can be fitted with cantilever platforms. Such towers are to be erected in accordance with the manufacturer's instructions and must only be comprised of components designed and supplied by the manufacturer for that purpose. If such towers are mobile, their stability will be affected, therefore great care is to be taken whilst moving them.

## **SCAFFOLD BOARDS AND STAGING**

Deck areas on aluminium towers must not to be made up of scaffold boards. If a bridge is being constructed between two towers, then proprietary staging units are to be used. Care is to be taken to ensure the stability of the towers. The staging is to be firmly supported on a load bearing part of the tower and secured to prevent movement with a minimum of 600mm oversail on either end support. If the unit is purpose designed with integral hooks for attachment to the tubular transom the oversail is not required. Guardrails and toe boards are to be provided to such staging.

Care should be taken that the design load and stability requirements are complied with and that the working platform width is a minimum of 600mm. This may require the use of two staging units.

## **INSPECTIONS**

### **Before Erection of Tower**

Ensure that the supplier's manual is on site and has been read and understood and that the operatives erecting the tower are competent.

The following components are to be checked to see that they are in good condition and are compatible:

1. Castors - to see that the castor housing and wheel are not damaged, that the wheel and swivels rotate freely and that the brake is effective;
2. Adjustable legs - to see that they are not bent, or threads damaged, threads are free from debris and clean, and that the device fitted to stop the leg falling out is functioning;
3. Frames - to see that the members are straight and undamaged, that they are free from extraneous material such as concrete. Spigots are to be straight and parallel with the axis of the column tube and locking devices functioning correctly;

4. Braces, stairways and ladders - to see that they are straight and undamaged and locking hook mechanisms are functioning correctly;
5. Platforms - to see that they are undamaged and the frames true and square. Plywood decks are not split or warped and are fixed firmly to the frames, where toe boards incorporate clips or fittings, that these are undamaged;
6. Ancillary parts, such as outriggers and stabilisers – to see they are undamaged and function correctly.

### **Before Use**

After the tower has been erected the following checks are to be made before it is used:

1. It is level and square and that the horizontal braces and platforms are level;
2. Outriggers or stabilisers are correctly positioned and secure;
3. Base plates or castors are fully in contact with the ground and castors are properly locked;
4. Spigot and socket joints are secure;
5. Bracing members have been located in accordance with the manufacturer's instructions;
6. Guard-rails and toe boards are in position;
7. Access stairways and ladders are in position and correctly secured;
8. The ground is clear of obstructions, potholes and overhead obstructions.

### **DURING USE**

During use the scaffold is to be kept in good order. Should parts become damaged they are to be replaced before the scaffold is used again. Due to the nature of and materials used in the construction of these towers they are unstable during high winds and are, therefore, not to be used in windy conditions. After high winds have been experienced they are to be inspected as detailed under the heading "Before Use".

A working platform that is used for construction work and from which a person could fall 2 metres or more must be inspected at least every 7 days and a formal record of inspection kept (this includes a mobile working platform).

Should a tower be used in a public place, housing estate or industrial area etc. then precautions should be taken to prevent unauthorised access onto or vehicles colliding with the tower. This may be by the use of security fencing. Certain locations may require a pavement license that may impose additional conditions of use.

If towers are to be left incomplete or damaged then they should display a notice warning of its condition. The sign must be clearly visible.

### **HANDLING & STORAGE**

The life of aluminium towers will be increased if proper care is taken during handling & storage. Before storage the components should be cleaned with any concrete or corrosive substances removed. Proper stacking will reduce damage and make identification of components easier.



1) Name and address of the Company/Person on whose behalf the inspection was carried out

### Inspection Report

#### Work at Height Regulations 2005

Report of results of every inspection made in pursuance of regulation 12

2) Location of the work equipment inspected. (Site address)

Description of the work equipment inspected	Date and time of inspection	Details of any matter identified that could give rise to a risk to the health or safety of any person	Details of any action taken as a result of any matter identified	Details of any further action considered necessary	Name and position of the person making report	Date report handed over



## **GUIDANCE NOTES – CRADLES**

### **INTRODUCTION**

A cradle is defined as a scaffold suspended by ropes or chains, by which it may be raised or lowered.

Two main types of cradle are used:

1. Suspended on blocks by natural or synthetic fibre ropes;
2. Suspended on wire ropes with hand or electrically operated lifting appliances mounted on the cradle.

### **INSPECTIONS**

Cradles shall not be used unless a competent person has inspected them within the seven days immediately preceding their use, after exposure to weather conditions likely to affect their strength and after any major alteration.

Records of all inspections are to be entered into a register, or Record of Inspections.

### **Examinations**

Cradles should also be thoroughly examined every six months and a report of this examination kept by the employer for 2 years.

### **WIRE ROPES, CHAINS AND LIFTING GEAR**

These are to comply with the requirements as detailed in the section “Lifting Accessories”.

### **OUTRIGGERS**

Rolled sections or suitably stiffened steel scaffolding tubes shall be used as outriggers for cradles. All poles in the framework shall be fixed at intersections to prevent displacement.

Counterweights shall be sufficient to withstand a minimum of three times the overturning forces.

One outrigger shall be provided for every suspension point.

### **SUSPENSION**

If the cradle is 10ft 6ins (3.2m) long or less, suspension can be by both natural or synthetic fibre rope (though not Nylon) and pulley blocks, in which case the ropes shall be no more than 10ft 6ins (3.2m) apart. If the cradle is larger than this it shall be suspended by wire ropes attached to the lifting appliance on the cradle itself.

## **COUNTERWEIGHTS**

Counterweights shall be adequate to counterbalance the loading placed on them and shall be locked into position to prevent interference or removal.

## **LIFTING APPLIANCES**

Winches shall be strong enough for the task and shall have been tested and examined in accordance with the Lifting Operations and Lifting Equipment Regulations 1998.

## **RECEIVING A CRADLE ON SITE**

Before the cradle becomes operational it is necessary to check the following:

1. That the lifting equipment is suitable for the task and that the relevant certificates are available;
2. That the cradle complies with the requirements of the job assessment.

## **LOADING**

Each cradle shall be marked with its safe working load and this loading shall not be exceeded.

## **TRAINING**

All persons involved with the erection of cradles shall receive instruction and training on the methods of erecting and dismantling the cradle and the maintenance and inspection requirements of a cradle whilst in use.

All persons required to work from cradles shall receive instruction of the safe working procedure, the raising and lowering of the cradles and the use of personal protective equipment.

## **PERSONAL PROTECTIVE EQUIPMENT**

All persons working in a cradle shall wear a safety harness and this shall, at all times, be securely attached to a secure anchorage point within the cradle.

Under no circumstance shall the harness be attached to the structure, building or the ropes from which the cradle is suspended.

## **WORKING PLATFORM**

The working platform of a cradle shall conform to the requirements as detailed in the section titled "Scaffolds".

## "HAND-OVER" CERTIFICATION

The person carrying out the installation of the cradle shall be required to inspect and test the cradle, prior to it being accepted for use, and shall issue a "Hand-Over" Certificate, stating that the cradle is suitable for use. This certificate shall be retained on site.

## CRADLE CHECKLIST

Prior to erection, the senior employee on site shall ensure that:

1. An experienced erector is employed;
2. The structure is capable of carrying the loads to be applied to it;
3. Any necessary licences and way leaves are obtained before the erection of the cradle;
4. Supervisors are sufficiently experienced and competent to supervise cradle operations;
5. Operatives are fully instructed as to the use of cradles, their safe working load and the dangers of open windows and other projections from the face of the structure;
6. Occupants of the building are fully aware of the dangers of opening outward-opening windows;
7. The person in control of the building or structure's electrical supply is aware that the power must not be isolated without prior liaison with the supervisor of the cradle;
8. All winches, ropes and wire ropes have test certificates and records of inspection that the inspections were carried out within the last 6 months and copies of the certification are left on site;
9. An emergency procedure is established and understood by all operators;
10. The cradle is not used until the relevant inspections have been carried out and recorded in the register.

After erection, the senior employee on site shall ensure that:

1. The outriggers, counterweights and fixings have been correctly installed;
2. The supporting ropes are securely anchored, not kinked or damaged and are reeved correctly into any drums, pulleys and guides and that any safety ropes are similarly checked;
3. A "Hand-Over" certificate has been obtained from the installer.

During use, the senior employee on site shall ensure that:

1. The safe working load is not exceeded;
2. The suspended platform roof beams, counterweights and fixings have not been moved or altered since the platform was installed;
3. All safety equipment - stops, override switches, brakes, alarms, etc. are in working order;
4. All power supplies, electrical cables and connections are in good order;
5. The power cable at roof level is looped and secured to prevent its own weight from disconnecting it;
6. Warning notices are placed at the electrical supply points, warning of the work being carried out and stating that the power must not be isolated;
7. All control buttons and switches are in good working order;
8. Where pendant controls are used, they are secured to the guardrail of the platform. Supply cables are not to be used for this purpose;
9. Hand tools are secured wherever practicable;

10. The cradle equipment is kept clean and immediately washed down if exposed to chemicals or fumes;
11. The cradle equipment is securely lashed down and fended off from the building when not in use. Particular care shall be taken if high winds are expected;
12. All defects are reported to the supplier and the cradle is not used until such time as the defects are corrected;
13. Work is suspended if high winds are experienced or forecast;
14. No part of the roof rig is moved whilst the cradle is in use;
15. Fibre or wire ropes and electrical cables are not positioned where they may be damaged by abrasion, oil or chemical contamination or immersion in water.
16. The platform floor is kept free of ice, snow, mud or other substances, which may cause a slippery surface. If this cannot be done, the floor shall be sprinkled with sand prior to use;
17. Rubbish is not permitted to accumulate on the platform;
18. No safety device is disconnected or otherwise prevented from working;
19. Precautions are taken to prevent damage to any cable or equipment from welding in the vicinity;
20. The electrical supply to the cradles is turned off when the cradle is not in use and that all electrical supplies and controls are secured against vandalism;
21. Less than two men do not operate cradles with dual electric motors;
22. Operators conform to this safe system of work;
23. The platform is at rest on the ground or other surface after use.

Operators shall:

1. Wear hard hats at all times, as objects may fall from above;
2. Not enter or leave the cradle other than at ground level or other safe access point;
3. Not engage in reckless or dangerous practices when operating or working in the cradle;
4. Use safety harnesses whilst in the cradle and secure the harnesses to the cradle and never to the structure.

## **GUIDANCE NOTES – GLAZING**

### **STORAGE - GENERAL**

Prior to storing glass, the strength of the flooring shall be ascertained to ensure its capability to support the weight to be exerted upon it.

Glass shall, generally, be stored on edge.

To minimise damage to the glass, it shall not be in contact with any hard materials such as metals, concrete, etc., but shall rest on timber, felt, rubber or similar soft material, and shall be placed in such a manner as to support the glass over its entire length and to spread the weight of the stack over a wide area of the floor.

The glass shall not be inclined at an angle of less than 3 or more than 6 degrees from the vertical

### **STORAGE - SITES**

When storing glass on site, particular attention shall be paid to the following to ensure that:

1. Sufficient space is available on site to permit access of delivery vehicles, both to deliver the glass and to enter the site after storage;
2. Sufficient and suitable racking is available on site;
3. Adequate means of unloading and handling the glass is available prior to delivery and that it is of the correct capacity;
4. The floors or platforms onto which the glass is to be placed are sufficiently strong to support the weight of the glass and packaging materials;
5. The storage area is not subject to wind conditions likely to affect the stability of the stacks or to make handling of the glass difficult;
6. The storage area is secure and materials within it are not likely to be subjected to damage from other contractors or members of the public;
7. Dry storage conditions can be provided and maintained.

### **GLASS HANDLING**

#### **Suction Pads (Josters)**

All suction pads are to be checked at the start of each working day. Special attention is to be paid to the condition of the neoprene/rubber head.

The suction pad is to be free from any defects that are likely to affect its strength and lifting ability, such as: -

1. Pitted labyrinth grooves;
2. Perishing;
3. Foreign bodies in the grooves;
4. Interlinking of the grooves with tears;
5. Contamination by grease or oil;
6. Softening.

Sucker heads are to be treated with care, they are: -

1. Not to be laid onto any surface that is likely to cause them damage;
2. To be capped at the end of the day;
3. To be stored in a dry place with the rubber pads in the flat relaxed position;
4. Not to be subjected to extremes of temperature;
5. Not to be stored anywhere near any petroleum or spirit based products.

It is to be borne in mind that sucker heads depend on a vacuum forming between the head and the glass. Anything that is likely to reduce this vacuum will adversely affect the lifting ability of the sucker.

Suction lifters shall only be used for lifting, carrying or holding objects with smooth non-porous surfaces for short periods of time and shall never be used on rough or porous surfaced materials.

During long periods of attachment the suction head shall be checked regularly to ensure good adhesion to the surface.

The safe working load of the suction head shall not be exceeded under any circumstances.

Alterations or modifications to the suction head shall not be carried out without consulting the manufacturer and shall only be carried out by persons deemed competent, by the Company, to do so.

Suction heads shall be cleaned with a solution of pure soap and warm water and shall be dried after cleaning.

### **Vacuum Lifting Frames**

Under the Lifting Operations Lifting Equipment Regulations, lifting frames are regarded as a piece of lifting equipment. Therefore, lifting frames are required to conform with the requirements, in that they are to be: -

1. Of good construction, sound material, of adequate strength, suitable quality and free from any patent defect;
2. Marked with a clear means of identification;
3. Clearly marked with their safe working load;
4. Thoroughly examined every six months, by a competent person, and a certificate of examination is to be kept available on site and a record kept of inspections in the employer's own register. In the case of a piece of hired equipment, the supplier should provide a copy of the certificate and this is to be kept on site.

Lifting frames are also to be visually checked at the start of every working day to ensure that they are in good order.

The suckers on lifting frames are to meet the same requirements as suction pads.

The following rules shall be followed whilst using vacuum lifting frames:

1. ALWAYS ensure that the faces of all pads and materials to be lifted are cleaned prior to lifting;
2. ALWAYS centre the lifter on the material to be lifted;
3. NEVER attempt to lift cracked or broken glass with the lifter;
4. NEVER attempt to use the lifter to lift materials with a rough or porous surface;
5. NEVER exceed the rated safe working load of the lifter;
6. NEVER attempt to lift the material from the horizontal position with the lift bar in the vertical position (parallel with the material);
7. NEVER operate the lifter when the vacuum indicator shows an inadequate vacuum;
  
8. NEVER permit persons to ride on the material or lifter;
9. NEVER lift over people;
10. NEVER remove, cover or deface warning notices or labels;
11. NEVER operate a lifter that is not clearly marked with its safe working load;
12. NEVER lift higher than necessary;
13. NEVER leave loads suspended;
14. NEVER alter or modify the lifter without consulting the manufacturer. Alterations or modifications shall only be carried out by persons deemed competent, by the Company, to do so.

### **Straps and Slings**

These are normally of leather or plastic with timber handles at each end. They shall be used for handling large sheets of glass, with the straps or slings under the bottom edge of the glass and the handles held either side by the operators.

They shall be inspected, visually, prior to use for signs of wear or damage. Any damaged or worn slings shall be taken out of use and returned for repair or replacement.

### **Glass Carriers**

Glass carriers for transporting single large sheets of glass shall be based upon a pair of wheels, centrally placed under the sheet of glass, secured to a timber base. The glass shall be supported by the operator or by the means of suction pads fitted to a vertical member. Such pads shall be treated in the same manner as previously detailed under "Suction Pads".

### **Wire and Synthetic Rope Slings**

These shall be used to lift and handle timber cases, etc. and shall conform to the requirements as detailed in the Section "Lifting Gear".

### **Chains and Lifting Beams**

These shall be used to lift and handle pallets, cullet bins and metal containers, etc. and shall conform with the requirements as detailed in the Section "Lifting Gear".

## **WEATHER CONDITIONS**

Great care is to be exercised when handling glass during windy weather. High winds can result in the glass becoming uncontrollable and either the operator falling or the material being dropped on those below.

If the glass becomes wet the effectiveness of the hand sucker can be decreased, due to the neoprene sliding on the wet surface. Therefore, all wet glass shall be "squeezed down" prior to any attempt being made to lift it.

When lifting glass during wet weather careful checks are to be made to ensure that water does not seep under the sucker, causing the sucker to lose its grip.

"Squeezing down" the glass will be insufficient to remove ice or frost from the glass. When working in temperatures below freezing care is to be taken to ensure that all ice particles have been removed, prior to affixing the suckers.

## **CLEANING**

The glass is to be properly cleaned prior to installation. It is only to be cleaned with a proprietary cleaner or water and is to be "squeezed down" to remove all excess moisture.

## **INSTALLATION**

Care is to be exercised during installation to ensure that the fittings holding the glass in position are not over tightened, as this may result in the glass breaking and falling.

## **ACCESS**

Access to the work place is only to be obtained using the correct access equipment, as detailed in the sections on scaffolding, ladders and working at heights.

Under no circumstances are makeshift forms of access to be used.

## **PROTECTIVE CLOTHING**

Safety footwear, hard hats and gloves will be provided for all employees engaged in handling glass. Safety footwear and hard hats are to be worn at all times whilst on site, with the exception of Sikhs, who, if wearing turbans, are not required to wear hard hats. Gloves are to be worn whilst handling glass. Where operatives have to remove broken items of glassware greater protection can be given wearing gauntlets or armguards.

## **GUIDANCE NOTES - HAND TOOLS**

### **GENERAL PRECAUTIONS**

#### **Quality**

Buying cheap tools is a false economy. They do not last and can be dangerous. Hammers and chisels of inferior steel can chip or shatter when struck. Cheap punches, drifts and cold chisels quickly mushroom, at the head. Cheap spanners and wrenches can open out or break. Knives of poor steel rapidly lose their edge, pressure is then necessary and the blade can easily snap. Similarly, blunt edges on hatchets and axes and worn teeth on saws result in a loss of control.

#### **Handles**

Handles are necessary for ease of manipulation and for the protection of hands. They are to be of good quality plastic or well seasoned durable hardwood, of smooth finish and firmly fixed. They are to be regularly checked for splits or cracks and wedged, where necessary, to keep them tight.

#### **Cleanliness**

Grease, moisture and dirt are to be regularly removed. All moving or adjustable parts are to be lightly oiled.

#### **Cutting Edges**

Cutting edges are to be kept sharp to allow accurate work and to avoid the hazards caused by excessive pressure.

#### **Repair and Storage**

All tools are to be regularly checked. They are to be thoroughly examined prior to storage and, if worn or damaged, repaired or replaced.

When not in use, tools are to be stored in boxes or racked.

#### **Selection**

Every tool has its proper application. The correct type, size and weight tool is to be selected for the job.

#### **Electrical Risk**

All metal tools are conductors of electricity. Where work takes place on or near live electrical apparatus, only properly insulated or non-conductive tools are to be used.

#### **Sparking Risk**

For work near highly flammable materials or explosive dust, special tools made of non-ferrous materials are to be used. Spark proof tools are to be regularly examined to ensure that no ferrous metals have become embedded in them.

## **INDIVIDUAL TOOLS**

### **Cold Chisels**

The cutting edges of cold chisels and bolsters are to be kept sharp. Re sharpened chisels are to be suitably hardened and tempered to keep them in a safe working condition.

Chisel heads mushroom in use. Any mushrooming is to be ground off and the edge left with a slight taper to reduce the tendency to mushroom.

The correct type and size of chisel is to be used, along with a hammer of the right weight.

Chisels are to be held in a steady and relaxed grip. The depth of the cut is regulated by the angle that the chisel is held at. Cutting or chipping work should be carried out with the edge of the chisel pointing away from the operative.

The use of chisels can result in flying debris; therefore eye protection is always to be worn by the operative and any others who may be exposed to the danger of flying debris

### **Files**

Files are made of highly tempered steel, which will shatter if struck or used as a lever.

The correct type and size of file is to be selected for the task. Handles are to be fitted to all sizes of files, to prevent damage to hands. The handles are to be in good condition and are to be regularly inspected. Files are to be kept free from oil and grease and not allowed to become rusty. The cutting surfaces of the file are to be cleaned regularly using a wire brush to prevent the teeth becoming clogged with waste material.

### **Hacksaws**

The correct type of blade is to be selected to suit the material being cut, teeth are to be set in the frame pointing forward and sufficient tension is to be applied to keep the blade rigid.

In use, strong steady strokes are to be made away from the operator and the full length of the blade used. Hard materials are to be cut slowly, to prevent the blade becoming overheated and blunt.

### **Hammers**

Heads of hammers are to be firmly and accurately set on the handle. If the head works loose it is likely to fly off, possibly causing serious injury.

Heads are to be secured with the correct wedges and kept in shape by occasionally grinding the face. Heads that show signs of cracking are to be disposed of.

Handles are to be in good condition.

The correct type of hammer is to be used for the task.

## **Jacks**

Jacks are to be heavy enough and strong enough to raise and maintain the load. They are to be placed on a firm, solid support. The load is to be on the centre line of the jack.

Once the load has been raised it is to be supported so that the security of the load is not solely reliant on the jack. Jacks are to be inspected and lubricated regularly and stored in the dry, to prevent corrosion.

## **Knives**

Knives are to be kept sharp. The correct knife is to be selected for the task. When not in use, knives are to be kept sheathed, the blade retracted or placed in slotted racks. Razor blades, or Stanley blades, are only to be used in the correct holders.

## **Picks and Shovels**

Picks and shovels are to be kept clean and in serviceable condition, with handles free from cracks and splinters. Shovel blades are not to be allowed to become blunt, turned, split or jagged. Pick head points are to be kept sharp and securely attached to the handle. When using a pick the operative is to ensure that his legs are spread, to prevent over-balancing. The wearing of safety footwear is mandatory. Care is to be taken that others are not in the area, where they may be struck by the pick.

## **Pliers**

Pliers are only to be used when there are no other tools suitable for the job.

All pliers are to be kept free from dust, grit and corrosion, with the moving parts lubricated. Rivets and bolts, holding pliers together, are to be sufficiently tight to ensure efficient working.

## **Punches**

Punches are to be straight and heavy enough for the work. Point of centre punches are to be kept accurately ground. Pin punches and starting punches are to be kept squared. The tools are to be held firmly and are to be started with light taps.

## **Screwdrivers**

Screwdrivers are one of the most commonly used tools and are regularly misused. They are not to be used as chisels, drifts or wedges. The screwdriver head is to be the correct size for the screw and its tip is to fit the slot.

The work is to be held firmly and a steady, even pressure, exerted on the screw.

Screwdriver handles are not to be hammered as this can cause the handle to split. If the handle is designed for use with a rubber grip, that grip must be fitted. Serious puncture wounds can be sustained if screwdrivers are carried in the pocket.

## **Spanners and Wrenches**

Only spanners of the right size are to be used. The length of the spanner is not to be adjusted by fitting an extension to it, as this will increase the likelihood of the spanner breaking. Spanners are to have square and undamaged jaws. Adjustable spanners and pipe wrenches will not withstand hammer blows. After use all spanners and wrenches are to be cleaned and any moving parts oiled, before storing in a box or rack.

## **Woodworking Tools**

The sharp edges of woodworking tools are to be kept sharp, to promote ease of working. Sharpening is to be carried out according to the type of tool. Chisels are always to be worked with mallets, as a hammer will split the handle. All sharp edged tools are to be racked with the edge downwards or are to have the edge protected.

Always select the correct type of saw for the task. Saw teeth are to be correctly set to avoid binding.

Timber to be cut is to be free of nails, etc. When saws are not in use, the teeth are to be clean and the blade wiped with an oily cloth, to prevent corrosion.

## **GUIDANCE NOTES – LADDERS**

### **PLAIN RUNG LADDER**

Ladders of various sorts are the most common means of temporary access in industry.

Timber ladders are economical but heavy, easily damaged and require maintenance. They must conform to BS1129. Aluminium ladders are more expensive but have a longer life span, during which maintenance is hardly needed. They must conform to BS2037.

Ladders are only to be used as a place of work “where it is reasonable to do so”. That is to say, only after a risk assessment has been carried out and the findings of that risk assessment allow use as a safe place of work.

### **CONSTRUCTION**

Ladders are to be of good construction, of suitable and sound material, of adequate strength with regard to the task they are to perform and are to be properly maintained.

### **USE**

Ladders are to be erected on a firm and level base and are to be properly and evenly supported on each stile or side. If the ground is sloping or uneven an adjustable safety foot is to be used.

Ladders not supported on a base are to be securely and equally suspended from each stile and are to be secured to prevent swinging or swaying. Long ladders may need to be tied in the centre of their length to prevent movement.

The head of a ladder is to be rested on a firm, solid surface. A ladder stay is to be used where the support may otherwise be unsuitable, such as a plastic gutter.

Ladders are to be placed to ensure that there is sufficient room behind each rung to allow for a proper foothold.

Only one person at a time is permitted to be on a ladder.

Metal ladders and timber ladders with metal stile reinforcements are not to be used where there is the possibility of an electric shock being received.

The top of the ladder is to project above the landing to provide a handhold for those using the ladder unless there is another sufficient handhold.

The correct slope for a ladder is an angle of approximately 75° to the horizontal, i.e. one metre out for every four metres of height.

Ladders standing on a base are to be securely fixed near to their upper resting place. If this is not possible they are to be secured near their lower end. Lashing or clamping each stile to a secure anchorage can normally achieve this.

If there is no other means of securing the ladder then it must either be footed by a second person or a proprietary brand of ladder securing device used.

## METAL LADDERS - STANDARDS

There are three standard types of metal ladders. Each type has been designed to be used under different weight loadings. These are:

Domestic	Only for use around the home, where conditions of use and storage should be good and the frequency of use light. Rated for 95Kg.	Colour coded RED
Light trade	Used for the building industry by tradesmen where conditions should be reasonable and would take regular use. Rated for 110Kg	Colour coded YELLOW
Industrial	For use in any industry where repeated access is required. It is intended for arduous use on site and in carriage. Rated for 130Kg.	Colour coded BLUE

Under no circumstances are domestic quality ladders to be used in the workplace.

Metal ladders are not to be used for any work on electrical installations or any work near live electrical apparatus.

## INSPECTIONS

Timber ladders are not to be painted or treated in any way that would prevent defects from being easily visible.

All ladders are to be easily identifiable and are to be inspected by a competent person every six months. The findings of this inspection are to be recorded in writing and to be kept in an easily accessible place. The ladder must also be inspected by the user, prior to use.

A ladder inspection should cover the following:

1. Timber ladders -cracks, splits, splintering, warping or bruising of the timber, Wooden stiles or sides and wooden rungs are to have the grain running along the length of the member;
2. Metal ladders - mechanical damage;
3. Rungs for signs of movement or undue wear. Missing rungs or defective rungs are not acceptable;
4. Wedges and tie rods for tightness. Metal reinforcing ties if the tenon joints are not secured by wedges. The ties are to be below the rungs when the ladder is in use;
5. Rungs are to be properly fixed and jointed into the stiles and are not to rely solely on being held in place by nails, screws, etc.;
6. Feet for splitting and fraying. Timber or metal inserts on metal ladders for wear and position;
7. Ropes for wear, fittings for security and pulleys for ease of operation.

These inspections are to be recorded in writing and this record kept easily available for inspection.

## **ERECTING AND LOWERING LADDERS**

The erection of plain and rung extension ladders is identical. The procedure is as follows:

1. Lay the ladder on the ground;
2. One person, taking hold of the top rung with the wire or metal support underneath the rung, is to lift the ladder and start moving his hands towards the bottom of the ladder;
3. At the same time the second person, acting as "anchor man" stands with one foot on the bottom rung and exerts a pulling, stabilising effort;
4. In unison the two people can pull the ladder into the vertical position;
5. Place the ladder against the structure at an angle of 75° and secure.

Where a short ladder is being used, one person can erect the ladder as follows:

1. Place the bottom of the ladder firmly against the base of the structure;
2. Lift the top of the ladder, and push upwards to raise the ladder to a vertical position;
3. When the ladder is vertical, transfer it to the required position.

Stepladders are to be erected as follows:

1. Stand the ladder on a firm, level area or prepare a suitable platform with scaffold boards;
2. Position the legs as far apart as the retainer will allow;
3. Check the ladder is level before using it.

Where roof ladders are to be used, a plain or extension ladder must first be erected as previously described. The procedure for erecting a roof ladder is as follows:

1. Proceed up the lower ladder to the eaves level, either carrying the roof ladder, or having it passed to you when you are at the top;
2. Slide the roof ladder up the slope with the hook uppermost;
3. When the hook has passed the ridge, turn the ladder over and ensure that the hook has engaged with the ridge;
4. Protect the roof covering with soft packing materials under the ladder if necessary;
5. Lash both ladders together with rope.

## **SUMMARY**

The following is a brief summary of safety points regarding ladders:

1. Use the ladder at the correct angle;
2. Wear clean footwear, free of mud and in good condition;
3. Always keep the ladder clean and in good condition;
4. Do not reach out from a ladder;
5. Never support a ladder on an insecure base, e.g. scaffold, loose bricks;
6. Always secure the ladder or get someone to hold it;
7. Wherever possible, carry tools in pouches or belts or have them hoisted to the workplace;
8. Store ladders to keep them in good condition;
9. Only one person at a time is to use a ladder;
10. If unsure in any way keep off the ladder.



## **GUIDANCE NOTES - POWER OPERATED WORKING PLATFORMS**

### **INTRODUCTION**

There are two main types of power operated work platforms, mobile and mast. Both of these provide an alternative to scaffolding when a working platform is required at height.

### **MOBILE WORK PLATFORMS**

This equipment is available in a wide variety of different types, ranging from small mobile tower structures, fitted with a self-elevating facility, to large truck mounted hydraulically operated platforms, which are closely related to mobile cranes.

#### **Safety Features**

Regardless of type there are a number of safety features that are to be present on the platform before it is used. These are: -

1. The operator controls shall be fitted at the platform level with an override at ground level for emergency use only.
2. The platform shall be fitted with guardrails and toe boards, with a safe means of access provided.
3. The chassis is to be fitted with a levelling device to ensure that the platform is vertical when in use.
4. All operators shall be trained and competent in the use of the equipment.
5. All units shall be fitted with an audible reversing signal.

#### **Safety Precautions**

The following safety precautions shall be taken:

1. The platform is only to be used on firm level ground, sufficiently compacted to take the weight of the platform, operators and materials.
2. All wheels shall be locked or outriggers used in accordance with the manufacturer's instructions.
3. Sole plates shall be used under the outriggers where necessary.
4. The safe working load is to be marked on the machine and shall not, under any circumstances, be exceeded.
5. Allowance shall be made for any effects that the wind may have on the platform.
6. Persons shall not leave the platform whilst it is in an elevated position, nor shall materials be transferred to or from the platform.
7. Stability of the platform shall be ensured at all times whilst it is in use.
8. The platform shall not be erected in the vicinity of overhead power lines until such time as the electricity board have provided details of the necessary clearances and these clearances have been complied with.

## **Maintenance and Inspections**

Maintenance, servicing and inspections shall be carried out in accordance with the manufacturer's instructions, and shall be carried out by suitably trained and experienced persons.

Inspections and examinations shall be carried out as follows:

1. Daily: the operator shall carry out a visual inspection, prior to use and after adverse weather conditions, such as rain.
2. Weekly: a person authorised for the purpose shall carry out an inspection and the findings recorded in a record of inspection. Any defect found shall be corrected immediately or the platform withdrawn from use.
3. Six monthly: after accidental damage or major repair or modification a competent person shall carry out an inspection. All working parts of the platform shall be thoroughly examined. A certificate shall be provided stating that the platform is safe to continue use and giving the date of the next thorough examination.

## **Records**

Records of all maintenance, repairs, inspections and examinations shall be kept at head office. The record of weekly inspections shall be retained with the platform. Machines that are hired in shall only be accepted if they are accompanied by proof of inspection.

## **MAST WORK PLATFORMS**

Mast work platforms, which need to be erected prior to use and dismantled after use, provide temporary working platforms providing access to localised areas above ground level.

Normally this type of platform consists of three parts:

1. A mast or tower, which supports the platform or cage. The mast or tower may be in one piece or may be sectional.
2. A platform or cage capable of supporting persons and equipment.
3. A chassis supporting the mast or tower structure. The chassis providing stability for the machine, with or without outriggers, up to a specified freestanding height, above which the mast or tower must be tied into the building or structure.

## **Erection**

Only fully trained and competent persons are to erect or dismantle the platform.

The manufacturer's erection procedure shall be followed. Surfaces on which the work platform is to be used shall be firm and level, within the manufacturer's specifications. When outriggers are used, the minimum ground support, as detailed by the manufacturers shall be complied with.

Arrangements shall be made to divert traffic from the area where the work platform is situated and barriers shall be erected in public areas.

## **Precautions in Use**

The following precautions shall be taken whilst the platform is being erected, dismantled or is in use:

1. The platform shall not be erected in the vicinity of overhead power lines until such time as the electricity board have provided details of the necessary clearances and these clearances have been complied with.
2. Extending columns shall not be erected above 5 sections unless they are tied into the structure.
3. The safe working load shall not be exceeded.
4. The maximum number of persons on each platform shall not exceed 3 for a single platform and 6 for a double platform.
5. Raising and lowering movements shall not be started until it has been established that there is adequate clearance from any obstructions.
6. Each platform shall be fitted with an audible alarm, which shall sound whilst the platform is moving.
7. Travel with the platform elevated shall not be permitted unless the work platform has been designed to permit this.
8. Work carried out from the platform shall be confined to the area bounded by the guardrails. Persons shall not be permitted to lean out of the platform. Fencing shall be provided and maintained to prevent persons working on the platform coming into contact with any moving parts of the platform.
9. Emergency controls, where fitted, shall not be used for the normal lowering or raising of the platform.
10. Platforms shall not be used in wind conditions above 31 miles per hour.

## **Maintenance and Inspections**

Maintenance, servicing and inspections shall be carried out in accordance with the manufacturer's instructions, and shall be carried out by suitably trained and experienced persons.

Inspections and examinations shall be carried out as follows:

1. Daily: the operator shall carry out a visual inspection, prior to use and after adverse weather conditions, such as rain.
2. Weekly: a person authorised for the purpose shall carry out an inspection and the findings recorded in a record of inspection. Any defect found shall be corrected immediately or the platform withdrawn from use.
3. Six monthly: after accidental damage or major repair or modification a competent person shall carry out an inspection. All working parts of the platform shall be thoroughly examined. A certificate shall be provided stating that the platform is safe to continue use and giving the date of the next thorough examination.

## **Records**

Records of all maintenance, repairs, inspections and examinations shall be kept at head office. The record of weekly inspections shall be retained with the platform. Machines that are hired in shall only be accepted if they are accompanied by proof of inspection.



## **GUIDANCE NOTES – SCAFFOLDING**

### **TRAINING**

All scaffolding work should be carried out under the supervision of a “competent person”.

Scaffolding should only be erected by trained competent scaffolders, the only exception to this would be during formal training where a student is undergoing supervised training and assessment.

### **ERECTING AND STRIKING SCAFFOLD**

Safety harnesses must be issued to all scaffolders, worn at all times when at work and used in accordance with the revised NASC Guidance Note SG4:00 ‘The Use of Fall Arrest Equipment Whilst Erecting, Altering and Dismantling Scaffolding’. The basic principles that all scaffolding contractors, principal contractors and clients should be aware of include:

### **HARNESSES**

Reference should be made to the safe system of work for the use of safety harnesses.

All those involved in scaffolding operations must wear and use safety harnesses constructed to British standard BS EN 365:1993 and have received appropriate and recorded training in the use, inspection and maintenance of such equipment.

When ‘clipping on’ a suitable anchor point must be used.

It is recommended that scaffolders install a single guardrail to all lifts at locations where falls could occur. When working within the single guardrail scaffolders do not need to be ‘clipped on’.

When moving above 4m (above ground level) or where falls of 4m or more are possible, and not working within a protected area, scaffolders must clip on to the first suitable anchor point. Anchor points should ideally be above waist height. When this is not possible anchor points below waist level should be used.

Scaffolders must adopt a method of work that will limit traversing at an exposed edge to the maximum length of the material used.

Scaffolders must remain ‘clipped on’ when:

1. Moving their working platform e.g. when raising or lowering boards;
2. Climbing up the structure to the next lift;
3. Working directly off the scaffold structure.

### **WORKING OUTSIDE THE SCAFFOLD**

When raising or lowering materials scaffolders should be ‘clipped on’ at all times or work within a safe handling platform with a double guardrail.

### **LADDER ACCESS**

Ladders for use by scaffolders should be included as early as possible into the erection process and removed as late as possible during dismantling, so reducing the need to climb the scaffold structure. It is recommended that a ladder bay is constructed and that ladders are incorporated from top to bottom of the scaffolding structure.

## DECKING

Scaffolders should use as a minimum a 600mm wide platform placed centrally (e.g. 3 x 225mm scaffold boards).

On wider scaffolding structures, scaffolders should utilise additional scaffold boards allowing sufficient space to 'clip on' to the ledger at platform level. Gaps should not exceed 225mm (one scaffold board) on each side of the platform.

Boards used for decking should always be adequately supported by transoms and bearers, i.e. every 1.5m or 1.2m as appropriate.

## SCAFFOLDING PRINCIPLES - TO BS 5973

It is essential to spend some time planning a scaffold, even the smallest. General purpose scaffolds above 50m in height, and special scaffolds require specialist planning and designing. More details are given later.

For general purpose scaffolds up to 50m high the following questions should be asked:

1. What is the scaffold to be used for?
2. What face area is it to serve?
3. What weight will be loaded onto it?
4. Is it likely to affect traffic or personnel access ways?
5. Is there anything about the shape of the structure that may affect the way in which the scaffold is based out?
6. What are the ground conditions like? Are there any manholes, basements, etc. to consider?
7. Are there any overhead services, particularly electrical?
8. Will there be any restrictions on tying-in (security problems, etc.).

The information received from this planning exercise will help determine the type of scaffold to be erected; the height, length and width; and the spacing of the standards and the distance between lifts, as set out in the classification table that follows.

The basic rules for erecting a scaffold are set out in BS 5973:

1. Check carefully the ground conditions and provide adequate timber soleplates to distribute the load. Set them at 90° or parallel to the structure. It is generally good practice to use one length of board to support two standards;
2. If the scaffold is based out on part of an existing structure, ensure that where it is to be based can support the weight, or provide "through" propping (after checking with the main or principal contractor);
3. Supply metal base-plates for every standard;
4. Ensure that the scaffolding components are in good condition and are of the correct type for the scaffold that is to be erected;
5. Cut a gauge rod for setting out;
6. Keep within erection tolerances;
7. Stagger the joints in both the vertical and horizontal planes (unless the scaffold is a demolition scaffold which needs to be uniformly reduced as the demolition progresses);
8. Fully board out each working platform;
9. Fix guard-rails, toe-boards and brick-guards where necessary;
10. Fix the necessary sway and ledger bracing;
11. Ensure that the scaffold is adequately tied to the building or structure.

The principal standards that apply to access scaffolding are:

BS1139	Metal Scaffolding Materials
BS2482	Scaffold Boards
BS5973	Code of Practice for Access and Special Scaffolds

## **PROTECTION OF THE PUBLIC**

During erection, modification and dismantling, care should be taken to exclude the public from the area of the work and a sufficient area around the work. It may be necessary to provide an adequately protected thoroughfare while the scaffold is in use. Effective steps should be taken to prevent persons being struck by falling objects. The provision of suitable brick guards, façade nets, sheeting or fans may be necessary.

Care should be taken that there are no protruding tubes, low headroom, etc. that could cause damage or injury to members of the general public. Where access through parts of the base of a scaffold structure might prove hazardous, entrance to such areas should be barred by means of a horizontal tube or other suitable obstruction.

## **SCAFFOLD CLASSIFICATION AND LOADING**

Un-sheeted access and working scaffolds may be constructed to a height of 50m, and sheeted access scaffolds to a height of 25m, without additional calculations, provided that they are constructed in accordance with BS5973 and maintain the spacing of standards, lift heights, loading, tie spacing, bracing and use correct couplings.

The following table of scaffold classification gives the requirements for both above types, including centres, loadings, etc., but BS5973 requires that sheeted scaffolds in this “standard” section are limited to 25m high and sheeted scaffolds above 25m high will require design attention, especially to the tying in requirements. Unsheeted scaffolds higher than 50m, require special design.

## **SCAFFOLD BOARDS (BS2482)**

The scaffold board with which we are most familiar is 225mm wide and 38mm thick. They should not span more than the dimension given on the end protection.

As timber is a natural material it must vary in quality so a visual check is carried out to select timber that complies with the standard. This check should be repeated each time that scaffold boards are used. Timber must be free from excessive splits (i.e. splits that extend more than 300mm from the end) shakes or decay. Any board which is noticeably lighter in weight, than the others in the stack, should be rejected.

Boards must not be excessively knotted, and measurement of knots is described at some length in the standard. Boards that have been used as shuttering for concrete or show signs of concrete contamination should be rejected. The action of concrete on wood is to draw the natural resin and with it the natural strength out of the board.

The surfaces shall have a sawn finish with the corners either left square or chamfered, and the ends bound with galvanised hoop iron extended for a minimum of 150mm along each edge or alternatively, special nailplates of galvanised steel pressed into the upper and lower surfaces near the board ends. Identification, and the permitted maximum span - which will be either 1.2m or 1.5m - should be stamped on the end protection.

Some suppliers supply boards which are not to BS2482 and may only be capable of spanning a maximum of 1.2m - keep a careful check on the end protection for these particular boards.

The maximum overhang of the boards beyond the end support transoms is four times the board thickness. For a 38mm thick board this is 152mm, generally accepted as 150mm. The minimum overhang is 50mm.

Some scaffolding contractors supply boards to their own specifications, which may vary slightly from BS2482, and if these are marked 1.5m maximum span then they should be capable of carrying the Safe Working Loads (SWLs) as specified in the loading tables of BS5973.

If a split occurs on the end of a board and approaches a length of 300mm, then nail plates can be pressed onto both faces to prevent further splitting.

If deck boards have been "fireproofed" then investigations should be carried out to ensure that this process has not reduced the normal strength of the board.

Do not use a scaffold board as a ramp, e.g. barrow runs over long spans. The same rules of supporting boards every 1.5m or 1.2m (as appropriate) still applies to ramps. Do not allow lorries and site plant to run over boards. Damage is inevitable and any subjected to this treatment should be downgraded and not used as deck boards.

## **FOUNDATIONS FOR STANDARD ACCESS SCAFFOLDS (UP TO 50 METRES HIGH ONLY)**

The foundations of a scaffold must be adequate to safely carry and disperse the load imposed, both locally at each standard, and in general to carry the complete weight of the scaffold. Foundations for scaffolds higher than 50 metres must be designed.

The foundation must be inspected regularly and maintained in an adequate condition during the life of the scaffold.

In order to support the standards and then to spread the load evenly onto various ground surfaces, timber sole plates are used.

These timbers are generally the same boards that are used as deck boards and, in fact, are usually selected from older, used deck boards with any damaged portions sawn off and rejected.

It is good practice to position at least two standards to one length of sole plate, and it is bad practice to position a standard over any joint in a sole plate.

The sole plates can be set either parallel or at right angles to the building face.

## TYING SCAFFOLDING

There is no doubt that more scaffolds collapse because of the removal of ties, or the failure to fit them in the first place, than for any other reason. Ties must be provided to resist both inward and outward movement of the scaffold and can normally be split into two classes:

1. Moveable Ties - these are ties that it may be necessary to remove temporarily, one at a time, to enable work to progress. They **MUST** be replaced as soon as possible;
2. Non-Moveable Ties - these are ties which remain undisturbed until the scaffold is dismantled. As these ties are always in place during the life of the scaffold, then fewer numbers of this type are required than those of the Moveable type.

## TYPES OF TIES

1. Box Ties: these consist of tubes and right-angled fittings that form a square and are usually fixed around columns, or other parts of the building, to resist both the inward and outward movement of the scaffold and at the same time give some degree of lateral restraint.
2. Through Ties: these consist of three tubes. The first spans across the inside of an opening in a building, such as a window opening. It is preferably vertical and resting on the floor but may be horizontal. The second tube is placed horizontally on the outside of the building, hard against the wall and overlapping the opening by about 300mm. The third tube (known as the tie tube) connects to both of the above tubes and also connects onto the scaffold ledgers. All couplers **MUST** be load bearing right-angled type and **NOT** "putlog" type.
3. Reveal Ties: these may be used where it is impracticable to open windows for "through" ties or even to drill into the wall for "anchor" ties, where the quality of the wall structure may be uncertain. Opposing faces of, say, the sides of a window opening or alternatively the lintel and sill of a window opening, if parallel and not sloping, may be used to make an attachment by means of a scaffold tube wedged or jacked tight between the opposing faces. The jacking is made by a reveal pin at one end of the tube and a plain base at the other end. Timber packing pieces, about 75mm square by 10mm thick, are required between the steel and the walls. The tie tube must be attached to the reveal tube, with right-angled load bearing couplers, as near as possible to the end opposite to the reveal pin. Due to the possible shrinkage of the timber packing pieces it is important that reveal ties are regularly inspected and tightened where necessary. It is recommended that they should not be relied on for more than 50% of the total number of ties required.
4. Bolt-in Ties: this type of tie is very effective in securing the scaffold to the building and a variety of expanding anchor sockets are available for fixing into holes drilled into brick or concrete and appropriate cleats or ring bolts then screwed into the anchors. When drilling into brickwork the anchor should be placed in the solid core of the brick and not near its edge. In some types of anchor sockets, the expansion required for fixing is not made by the turning in of the screw bolt or ring bolt but rather by a hand hammer and a hardened steel rod tool. Reference should be made to the supplier's instructions.

In all cases, the tie tube must be connected by right-angled load bearing couplers. It is preferred that the tube is connected to both standards but, if the tube restricts movement along the scaffold platform, then it may be connected to the inside standard only, provided that the coupling is load bearing with a SWL of 6.25kN.

The spacing of scaffold ties is not to exceed the following:

Movable ties	Unsheeted scaffold	32m <sup>2</sup> Maximum height 50m
	Sheeted scaffold	25m <sup>2</sup> Maximum height 25m
Non-movable ties	Unsheeted scaffold	40m <sup>2</sup> Maximum height 50m
	Sheeted scaffold	32m <sup>2</sup> Maximum height 25m

The spacing of ties throughout the structure is not to exceed 8.5m either vertically or horizontally. The ties are to be distributed evenly over the area of the scaffold.

Reveal ties are not to constitute more than 50% of the total number of ties. Where this is not possible, there should be at least one reveal tie for each 22m<sup>2</sup> of scaffolding. Unless specifically designed to do so, no scaffold is to depend purely on through ties.

## BRACING

Ledger Bracing is placed on alternate pairs of standards and is best fitted from ledger to ledger, using right-angled load bearing couplers. If this causes problems on boarded lifts, then the brace may go from inside ledger down to the guardrail but then every pair of standards must be braced.

It is also acceptable to connect the bracing to the standards, using swivel couplers.

Where the lower lift is in excess of 2.7 metres (e.g. when scaffolding over access ways) knee braces must be inserted on every pair of standards, commencing at 1.8 metres, set in a herringbone fashion.

Sway bracing must be provided to all scaffolds in which movement is not prevented along the face of the building in some other way.

This can be arranged in two ways:

1. In a zigzag line across one bay of scaffold on the outside face, from top to bottom of the scaffold. To be repeated every 30 metres along the face of the scaffold;
2. Using a continuous tube on the outside face of the scaffold at an angle between 35° and 55°. The bracing may be connected by swivel fittings to the standards or, alternatively, to extended transoms using right-angled load bearing couplers. When connecting to transoms it is important that the transom is itself connected to its supporting ledger with load bearing couplers (not putlog couplers).

## **FOUNDATIONS**

Foundations must be adequate to bear the load and every standard which is pitched from the ground must stand on a metal base plate. Unless this is pitched on material of sufficient hardness this base plate must stand on a timber soleplate of at least 35mm thick and of adequate surface dimension. Scaffolds over 50m high require foundations to be specially designed.

## **STANDARDS**

Standards may not deviate from the vertical by more than 20mm in any length of 2 metres or by more than 50mm in the whole structure. Joints should be staggered and tubes supported at intervals not exceeding 2.7m.

## **LEDGERS**

Ledgers must be fixed to standards with right-angled load bearing couplers and should be horizontal, except that a “foot” lift may follow the slope of the ground. In this case the transoms may be attached to the standards and the ledgers to the transoms.

## **JOINTS**

Joints in Standards must be staggered and sleeve couplers or spigot pins may be used. However, if tension or uplift is expected, then only use sleeve couplers that can accept a load of 3.1kN in tension. Spigot pins cannot be used for tension forces. The code states a preference for sleeve couplers.

Joins in Ledgers must also be staggered, and preferably made at a distance of one third of the span between two standards. The connection may be made with sleeve couplers or spigot pins, but if tension is expected on the tube, only use sleeve couplers.

It is considered good practice to use sleeve couplers if the joints in the ledgers are beyond 450mm from a standard. For access scaffolds over 50m high, sleeve couplers are recommended throughout.

## **TRANSOMS AND PUTLOGS**

Where transoms are used to support a working platform, constructed of 38mm thick boards, they should be fixed not more than 1.5m or 1.2m apart (depending on the type of boards being used) and connected with right-angled couplers or putlog couplers unless bracing tubes are connected to them when only right-angled couplers may be used.

Transoms on non-boarded lifts, known as structural transoms, shall be fixed at the rate of one per pair of standards and positioned within 300mm of the standards. They may be fixed using right-angled couplers or putlog couplers except when the scaffolding is higher than 50m when the connections **MUST** be made with right-angled load bearing couplers.

## **WORKING PLATFORMS**

Widths of working platforms should be as required by the Construction (Health, Safety and Welfare) Regulations 1996 (a minimum of 600mm). The gap between the inside board and the building shall be as small as possible, except where it is required for people to sit on the edge of a boarded deck in which case the gap should not exceed 325mm. The gap must be filled in when not being used.

## **GUARDRAILS**

Working platforms from which a person may fall a distance liable to cause personal injury must have a main guardrail fixed inside the standards at a height of at least 950mm above the level of the decking. There must not be an unprotected gap exceeding 470 mm between any guardrail, toe-board or other similar means of protection; in practice, this may mean the insertion of an intermediate guardrail.

## **TOE BOARDS**

Toe boards must be suitably fixed to any working platform from which a person may fall a distance liable to cause personal injury. They should be at least 150mm high and should be placed inside the standards.

## **BRICK GUARDS**

Brick guards, or other suitable vertical protection, are required where materials may fall from the scaffold, e.g. when materials are stacked higher than the toe boards. These screens can be hung from the guardrails and should be prevented from outward movement. They must be capable of preventing materials from falling through.

## **LADDER ACCESS**

Every sloping ladder should stand on a firm and level base and must be tied at the upper deck level. Ties must be made using the stiles of the ladder and not the rungs.

Where practicable, it should be set at an angle of 4 vertical to 1 horizontal. Ladders should project above the top landing above the level of the landing platform to provide a secure handhold unless there is some other handhold provided. The vertical distance between two successive landing places should not exceed 9.0m. The landing places must be kept clear of all materials and should be provided with guardrails and toe boards.

## **GIN WHEELS**

Gin wheels of 50kg maximum loading can be used to raise and lower materials and should be positioned at a point not more than 750mm from the scaffold face. The support for a gin wheel must be connected with right-angled couplers to two standards. Hook-on types of wheels must be lashed and moused. Ring and Lashed-on types must be held in position by two scaffold fittings. Materials must be firmly attached to the gin wheel rope.

## INDEPENDENT TIED SCAFFOLD

This type of scaffold is erected independently of the building, in that it will support its own weight and the load placed upon it, but it must be tied into the building to ensure stability.

An Independent Tied Scaffold is constructed with two parallel rows of standards, each row connected together with ledgers using right angle load-bearing couplers. Transoms span the inner and outer ledgers on which they are fixed using putlog couplers. Transoms must not be more than 1.5m apart for 38mm boards, and 1.4m is preferred. Normally the inner standards are set 325mm from the face of the building that provides space for one 225mm board plus 100mm working clearance.

The distance between inner and outer standards is determined by the type of work being done, but is not usually less than 924mm for four boards.

The distance between the standards must be determined by:

1. The load that the scaffold is required to carry;
2. The height of the scaffold;
3. The number of working lifts.

Ledger bracing must be incorporated in the scaffold at every other pair of standards and sway bracing must be fixed across the outer row of standards to prevent longitudinal movement and should be connected to the horizontal tubes with load bearing couplers. Lifts are usually set initially at floor levels and subsequently adapted to suit the requirements of the following trades. The distance between ledgers must not exceed 2.7m. The scaffold must be tied.

## PUTLOG SCAFFOLDS

Putlog Scaffolds are mainly used as bricklayers' working platforms and depend for their inner support on the brickwork of the building. The standards are normally set at 1.8/2.0m intervals according to load. The ledgers normally rise at 1.35m lifts with the progress of the work and only one lift may be boarded out at any one time. Ledgers should remain in place as the scaffold rises.

The distance from the standards to the wall should be between 1.3/1.4m allowing for five boards and sufficient room to "plumb up". Standards must be vertical and pitched on metal base plates on timber sole plates of adequate dimensions, bearing in mind the ground conditions. Joints in standards must be staggered to distribute the weak points in the scaffold and should occur near ledgers.

Putlogs are connected to the ledgers at intervals of not more than 1.5m with the full flat bearing surface in or on the bedding joints of the brickwork. Where putlog scaffolds are erected against existing brickwork, old putlog holes or new ones can be raked out with blades inserted vertically. Intermediate putlogs may be removed as the work progresses providing that one putlog remains within 300mm of each standard and are connected with load bearing couplers. Where putlogs are required to support working platforms at a gap in the wall, a bridle tube must be fitted to the underside of the putlogs on either side of the gap.

For the first few lifts, and until the scaffold reaches the height at which ties into the building are required, some form of raking tube should be incorporated to ensure the stability of the structure.

Facade bracing is required set along the outlines of the scaffold normally at 45 degrees that goes right across the elevation on short lengths and picks up to end three standards on long elevations. Tying into the building is of paramount importance and effectiveness of the ties must be sufficient to prevent the putlogs from pulling loose from the building.

## **BIRDCAGE SCAFFOLD**

Birdcage scaffolds are normally used for interior work in larger buildings like factories, public halls, cinemas, churches, etc. to provide access to ceilings, walls or soffits for light work, such as painting, plastering and decorating.

### **Base**

The floor of the building has to carry the full load of the scaffold and the total weight involved should be distributed as widely as possible. Floors must be carefully examined before the scaffold is begun and, if there is any doubt as to whether they are capable of supporting the weight of the scaffold, they should be shored. Soleplates serve two purposes - they distribute the load of the scaffold and also help to prevent damage to the flooring. Soleplates should always be set at right angles to floor beams or joists.

### **Standards**

Standards, on base plates, should be set vertically in rows at no more than 2.5 m centre to centre in each direction. All joints in standards should occur near ledgers and be staggered.

### **Ledgers**

Ledgers should be fixed horizontally to the standards with right angle couplers. The first lift should not be more than 2.5m high and subsequent lifts should be at 2.0m intervals. Any joints should be staggered; should be made with sleeve couplers and should be positioned at not more than one third of the distance between standards.

### **Transoms**

On all lifts, except the top, transoms should be set horizontally and fixed to standards with right angle couplers. At working platform level, transoms should be spaced at not more than 1.5m intervals and fixed to ledgers with right angle or putlog couplers.

## Working Platform

The platform at the top of the scaffold, which should not carry more than 0.75kg/m<sup>2</sup>, should be closely boarded and should cover the whole plan area. Other platforms may be erected at any lift in the side bays and requirements are similar to normal working platforms. The minimum widths of a working platform shall be as follows:

When used only as a footing	640mm (25ins)	3 boards
For the deposit of materials and a footing	870mm (34ins)	4 boards
To support a higher platform	1.05M (42ins)	5 boards
Dressing or shaping stone	1.3 M (51ins)	6 boards
Dressing or shaping stone and support a higher platform	1.5 M (59ins)	7 boards

Wherever materials are deposited, a clear gangway of 640mm (25ins) is to be maintained. Wherever the passage of materials is necessary, a clear gangway of 640mm (25ins) is to be maintained.

## Bracing

Diagonal bracing should be provided, based on a run of bracing for every six standards in each line.

## Tying

When the scaffold is within, or against, an existing structure it is often convenient to extend transoms or ledgers to butt to the walls or to use push/pull fixings. No standard should be more than 6 tubes away from a restraint point and at least one should be provided for every 40m<sup>2</sup> of vertical face. The working lift should be tied and butted to the main structure at approximately every 8m.

## Guardrail and Toe Boards

Guardrails and toe boards are required at every side of all working platforms from which men and materials can fall more than 2m. The main guardrail must be at least 950mm above the edge from which a person may fall; the toe-board must be at least 150mm high and there must not be an unprotected gap exceeding 470mm.

## LOADING CHART

	Inspection and very light duty	Light duty	General duty	Heavy duty	Masonry or special duty
Distributed loads on the platforms	75 Kg/m <sup>2</sup> (15 lb/ft <sup>2</sup> )	150 Kg/m <sup>2</sup> (30 lb/ft <sup>2</sup> )	200 Kg/m <sup>2</sup> (42 lb/ft <sup>2</sup> )	250 Kg/m <sup>2</sup> (52 lb/ft <sup>2</sup> )	300 Kg/m <sup>2</sup> (62 lb/ft <sup>2</sup> )
Duties	Inspection painting, stone cleaning, light cleaning access	Painting, stone cleaning, glazing, pointing, plastering	Brickwork, window fixing, mullion fixing, rendering, plastering	Brickwork, blockwork, heavy cladding. Putlog scaffolds can have this load rating	Masonry, blockwork, very heavy cladding. Putlog scaffolds can have this load rating
Maximum number of platforms	1 working platform	2 working platforms	2 working platforms + 1 at very light duty	2 working platforms + 1 at very light duty	Working platform + 1 at very light duty
Commonly used widths using 225mm wide boards	3 boards	4 boards	5 boards or 4 boards + 1 inside	5 boards or 5 boards + 1 inside or 4 boards + 1 inside	6 to 8 boards
Maximum bay length	2.7m 8.8ft	2.4m 7.8ft	2.1m 6.8ft	2.0m 6.5ft	1.8m 5.8ft

## INSPECTION OF SCAFFOLDS

When completed, scaffolds should be left in a condition suitable to perform the duty for which they were intended and they should comply with the requirements of the statutory regulations and any local authority requirements.

A scaffold should be inspected by the organisation which built it before it is handed over for use. The user should inspect it weekly to see that it remains in compliance with the statutory regulations and should maintain records of their inspections.

When equipment, other than scaffolding materials, is attached to a scaffold (which is subject to statutory inspections), this other equipment should also be inspected and the appropriate certification made.

Additional equipment may include: lighting; lifting appliances and lifting gear; electrical supplies; hoist ways; ropes.

It should also be remembered that any employer whose employees use a scaffold, which is provided by another contractor (usually the main contractor), has a responsibility for the safety of his own employees and should satisfy himself of the safety of the scaffold.

## SCAFFOLD INSPECTION CHECK LIST

Scaffolds			
<u>Footings</u> Soft and uneven No base plates No sole boards Undermined	<u>Standards</u> Not plumb Joined at same height Wrong spacing Damaged	<u>Ledgers</u> Not level Joined in same bays Loose Damaged	<u>Putlogs/Transoms</u> Wrongly spaced Loose Wrongly supported
<u>Couplers</u> Wrong fitting Loose Damaged No check couplers	<u>Bridles</u> Wrong spacing Wrong couplers Weak support	<u>Sway/Face Bracing</u> Some missing Loose Wrong fittings	<u>Ledger Bracing</u> Some missing Loose Wrong fittings
<u>Ties</u> Some missing Loose Physical - not enough Reveal - too many	<u>Decking</u> Bad boards Trap boards Incomplete Insufficient support	<u>Loading</u> Too heavy Shuttering propped	<u>Brick Guards</u> None Insufficient Not secure
<u>Guardrails</u> Wrong height Loose Some missing Unprotected gap	<u>Toe Boards</u> Wrong height Loose Some missing	<u>Ladders</u> Damaged Insufficient length Not tied	<u>Access</u> Obstructed Not enough
<u>Gin Wheels</u> Weak supports No identification Hook not moused No check fittings	<u>Fans</u> Weak supports Missing boards No check couplers	<u>Hoist Towers</u> Not enough ties Fencing/gates Operating position	<u>Platforms</u> Not wide enough Cluttered Insufficient

Mobile Towers			
<u>Height/Base Ratio</u> Internal - 3½ to 1 External - 3 to 1 PASMA Guidance	<u>Surface</u> Soft Uneven Sloping	<u>Access</u> No ladder Insufficient length Ladder not tied	<u>Bracing</u> Some missing Wrong direction
<u>Brakes/Chocks</u> Not provided Not secured	<u>Wheels</u> Not anchored	<u>Guardrails</u> Wrong height Loose/missing Unprotected gap	<u>Toe Boards</u> Wrong height Loose/missing

## DEFINITIONS

**Adjustable Base Plate:** a base plate incorporating a screw jack.

**Base plate:** a metal plate, with a central 50mm (2in) long spigot, for distributing the load from a standard, raker or other load bearing tube. The plate should be approximately 155mm x 155mm square.

**Bay:** the space between the centre lines of two adjacent standards along the face of the scaffold.

**Bolted Ties:** an assembly of bolts, nuts, anchors, rings or tubes fixed to the surface of a building, used to secure a scaffold to the structure.

**Box Tie:** an assembly of tubes and couplers forming a frame around part of the structure and used to secure a scaffold to it.

**Brace:** a tube fitted diagonally to two or more other members within the scaffold to increase stability.

**Brick Guard:** a barrier, normally a metal grid, positioned between the toe board and handrail of a working platform to prevent materials from falling.

**Bridle:** a horizontal tube fitted across an opening to support the inner end of a putlog transom or tie member where it is impossible to secure it into the structure.

**Butt Tube:** a short length of tube.

**Castor:** a swivelling wheel secured to the base of a standard to allow the movement of a mobile scaffold.

**Check Coupler:** a coupler added to a joint under load to give added security to the coupler supporting the load.

**Competent Person:** a person with sufficient practical and theoretical knowledge and actual experience of scaffolding to enable them to detect the defects and to assess their importance in relation to the strength and functions of the scaffold.

**Coupler:** a component for joining tubes.

**Expanding Spigot:** see *joint pin*.

**Extension Bracket:** see *hop up*.

**Finial Coupler:** coupler used to fix a tube across the end of another at right angles, such as a guardrail.

**Free Standing Scaffold:** a scaffold, which is not attached to a structure and is stable against overturning by design.

**Gin Wheel:** a single pulley for fibre ropes attached to a scaffold for raising or lowering loads.

**Guard Rail:** a member in the structure to prevent the fall of persons from a platform or access way.

**Hop Up:** a bracket, usually attached to the inside of a scaffold, to enable boards to be placed between the scaffold and the structure.

**Independent Tied Scaffold:** a scaffold that has two lines of standards supporting the platform and tied to the structure.

**Joint Pin:** an expanding fitting placed inside the bore of two tubes to form a longer tube.

**Ledger:** a longitudinal tube fixed parallel to the building in the direction of the larger dimension of the scaffold attached to the standards and acts as a support for transoms and putlogs.

**Lift:** each horizontal level of a scaffold.

**Lip Tie:** an assembly of tubes forming an "L" or "J" shaped hook round an inside surface of a structure, forming an anchor to which a scaffold may be tied.

**Movable Tie:** a tie that may be temporarily removed during the execution of the work.

**Non-Movable Tie:** a tie that will not be moved during the life of the scaffold.

**Parallel Coupler:** a coupler to join two tubes in parallel.

**Prop Tie:** telescopic prop and/or scaffold tube jacked or wedged between the floors of a structure, forming an anchor to which a scaffold may be tied.

**Puncheon:** a vertical tube supported at its lower end by a tube or beam and not by a solid surface.

**Purlin:** a tube secured to the rafter of a building and parallel to the ridge for the purpose of attaching the roof covering and to act as a stiffener for the rafters

**Putlog:** a tube with a flattened end to rest in or on part of the brickwork or structure.

**Putlog Adapter:** a fitting to provide a putlog blade to the end of a scaffold tube.

**Putlog Blade:** the flattened end of a putlog.

**Putlog Coupler:** a coupler used to fix a putlog or transom to a ledger, or to connect a tube, used only as a handrail, to a standard. A non-load-bearing coupler.

**Raker:** an inclined load bearing tube.

**Reveal Pin:** a fitting used to tighten a reveal tube.

**Reveal Tie:** components used to secure a scaffold to a structure using reveal tubes.

**Reveal Tube:** a tube fixed by a threaded fitting or by wedges between opposing surfaces of a structure, such as a window, to form an anchor to which the scaffold may be secured.

**Right Angled Coupler:** a coupler used to join two tubes at right angles. A load bearing coupler.

**Scaffold:** any temporarily erected structure providing access for persons and/or materials, or from which persons work, or which is used to support materials, plant or equipment.

**Scaffold Board:** softwood board used to provide access, working platforms and toe boards on a scaffold.

**Sleeve Coupler:** an external coupler used to join two tubes to form a longer section of tube.

**Sole Plate:** timber, concrete or metal spreader used to spread the load from a base plate to the ground.

**Standard:** a vertical or near-vertical tube.

**Swivel Coupler:** a coupler used to join two tubes at angles other than right angles.

**Through Tie:** a tie through a window or other opening.

**Tie:** the components used to secure a scaffold to a structure.

**Tie Tube:** a tube used to connect a scaffold to an anchorage.

**Toe Board:** board at the edge of a platform intended to prevent materials and persons falling from the platform.

**Transom:** a tube spanning between ledgers to connect the inner standards to the outer, and/or to form a support for boards, etc. forming the working platform.

**Working Platform:** the deck from which work is carried out.

## MOBILE ALUMINIUM TOWERS

Aluminium alloy scaffolding provides a safe and effective working platform, provided that certain rules are observed.

### Guardrails and Toe boards

The Construction (Health, Safety & Welfare) Regulations require that working platforms are provided with guardrails and toe boards. The scaffold is to be supplied with suitable guardrails and toe boards, which satisfy these requirements and they are to be used at all times and are to be positioned in accordance with the manufacturer's instructions, as given in the erection manual.

### Working and Intermediate Platform

Platforms are to be constructed from scaffold boards or are to be as supplied by the manufacturer. All hooks and/or fittings are to be properly engaged with their supports and all platforms are to be level and firmly seated.

## **Safe Loading**

The manufacturer's instruction documentation will provide details of the loadings that may be placed on the scaffold. When loading the scaffold, consideration must be given to including the weight of the scaffold into the safe working load.

## **TOWER SCAFFOLDS**

### **Stability**

Where towers are being used inside buildings, or in other environments where they are not subjected to wind forces, then the working platform can be at a height from the ground of 3.5 times the effective base dimension. Where the tower is used outside or in exposed conditions the height from the ground to the working platform is not to exceed 3 times the effective base dimension.

### **Safe Loading**

Generally the manufacturer's instructions will give the safe working load that can be placed on any platform, the safe working load that can be placed on the tower as a whole and the safe working load on the castors. The castors will have this loading marked upon them.

### **Moving**

Towers are never to be moved with men or materials on the platform and are only to be moved by applying force at or near the base of the tower.

All holes, ducts, pits or gratings near the tower, are to be securely covered prior to movement being carried out.

If towers fitted with outriggers are to be moved regularly, it is advisable that the outriggers should also be fitted with castors.

## **CANTILEVER PLATFORMS**

Towers can be fitted with cantilever platforms. Such towers are to be erected in accordance with the manufacturer's instructions and must only be comprised of components designed and supplied by the manufacturer for that purpose. If such towers are mobile, their stability will be affected, therefore great care is to be taken whilst moving them.

### **Scaffold Boards and Staging**

Deck areas on aluminium towers must not to be made up of scaffold boards. If a bridge is being constructed between two towers, then proprietary staging units are to be used. Care is to be taken to ensure the stability of the towers. The staging is to be firmly supported on a load bearing part of the tower and secured to prevent movement. Guardrails and toe boards are to be provided to such staging.

## **INSPECTIONS**

### **Before Erection of Tower**

The following components are to be checked to see that they are in good condition and are compatible:

1. Castors - to see that the castor housing and wheel are not damaged, that the wheel and swivels rotate freely and that the brake is effective;
2. Adjustable legs - to see that they are not bent, or threads damaged, threads are free from debris and clean, and that the device fitted to stop the leg falling out is functioning;
3. Frames - to see that the members are straight and undamaged, that they are free from extraneous material such as concrete. Spigots are to be straight and parallel with the axis of the column tube and locking devices functioning correctly;
4. Braces, stairways and ladders - to see that they are straight and undamaged and locking hook mechanisms are functioning correctly;
5. Platforms - to see that they are undamaged and the frames true and square. Plywood decks are not split or warped and are fixed firmly to the frames, where toe boards incorporate clips or fittings, that these are undamaged;
6. Ancillary parts, such as outriggers and stabilisers – to see they are undamaged and function correctly.

### **Before Use**

After the tower has been erected the following checks are to be made before it is used:

1. It is level and square and that the horizontal braces and platforms are level;
2. Outriggers or stabilisers are correctly positioned and secure;
3. Base plates or castors are fully in contact with the ground and castors are properly locked;
4. Spigot and socket joints are secure;
5. Bracing members have been located in accordance with the manufacturer's instructions;
6. Guard-rails and toe boards are in position;
7. Access stairways and ladders are in position and correctly secured.

### **During Use**

During use the scaffold is to be kept in good order. Should parts become damaged they are to be replaced before the scaffold is used again. Due to the nature of and materials used in the construction of these towers they are unstable during high winds and are, therefore, not to be used in windy conditions. After high winds have been experienced they are to be inspected as detailed under the heading "Before Use".

A working platform that is used for construction work and from which a person could fall 2 metres or more must be inspected at least every 7 days and a formal record of inspection kept (this includes a mobile working platform).

## **READING SCAFFOLD DRAWINGS**

Most scaffolds that are erected on construction sites are of the straightforward Independent-Tied, Putlog or Birdcage type. These will not normally be the subject of a special drawing but will be erected from the scaffolder's own training and experience.

Scaffolds with special features - shoring scaffolds, cantilevers, temporary roofs, etc. should always be designed by a competent person.

The charge hand scaffolder should study the drawings and not start erection until he fully understands them. Any doubts that he may have should be referred back to the designer.

The scaffold must not deviate from the design as this may result in a scaffold collapse.

Scaffold drawings show views of the job. A view as shown from above is called a "plan". A view shown horizontally is called an "elevation". There may be several elevations marked, as appropriate, - front, section, rear, etc.

If the scaffold is assumed to be cut through, it is called a "cross section" and the cut is marked, e.g. "A - A" on the plan so that it can be easily located.

If part of the scaffold construction is particularly complicated, a detailed drawing of that part may be drawn to a larger scale than the rest of the drawing. The detail can be located on the drawing either by description, lettering or by arrow.

Where large sections of the scaffold are to be of the same construction, it may not, or need not, all be drawn but noted "Typical Front Elevation" (or as appropriate). It is to be understood that the remainder of the elevation will be the same construction.

### **Front Elevation**

These views normally show standard spacing, lift height, full height and length of the job. It is important on this elevation to look for datum marks, so that different parts of the scaffold can be properly located. The drawing may also show how the lift heights are related to the structure and the position of facade bracing, ties, etc.

### **Flank Elevation**

These views may show width and height of the scaffold and distance from the building. It may show the lift heights, vertical distance between ties and the type of ties to be used. It will also show how the lifts are to be braced.

### **Plan Views**

These are usually the most important for locating the scaffold in relation to the site as a whole, and the exact location of the base plates, which may be critical in some cases. Also horizontal diagonal bracings may be detailed on these views.

## **Cross Section**

These are given where front or flank elevations are not explicit enough and drawn to give greater explanation of what is required. A good example would be across the centre portion of a Flying Shore; this is the simplest way of showing the internal construction of the shore.

## **Conventions**

Conventions are the markings on a particular section of the drawing to make it more easily understood and to avoid confusing the drawing with too many lines. The most common are:

1. A large "X" where check couplers are to be used;
2. "Dashes" or "dotted lines" to denote bracing at right angles to the view shown;
3. A "jagged edge", which indicates that the detail does not end there.

## **Scales**

In order that the view of the scaffold may be drawn on to paper, it must be reduced in size whilst still retaining that essential detail in the correct proportions. The scale is a measurement of the reduction and will normally be indicated in the bottom right hand corner. Different views may be drawn to different scales, even on the same drawing.

It should never be necessary to "scale off" drawings as sufficient dimensions should be given.

If a scale is indicated as, say 1:50, then this simply means that it is one 50th of full size.

## **When reading drawings:**

1. Look closely at the detail to see if tube members pass on top of or underneath the members;
2. Check where the load bearing couplers are to be used;
3. Check where check fittings are to be used;
4. Appreciate that notes may be written anywhere on the drawings; read them carefully and follow their instructions.

## ON SITE CHECKLIST

Tubes must not be bent, split, badly corroded or distorted. Fittings must not be distorted and moving parts must be sound and lubricated.	
Scaffold boards should be in serviceable condition.	
All standards must be plumb and all transoms and ledgers must be level.	
There should be a base plate under every standard.	
Sole plates are normally required to distribute loads and prevent damage, but may be omitted in certain instances where the ground will bear the load e.g. a substantial concrete base.	
Joints in standards should be in alternate lifts.	
Joints in ledgers should be in alternate bays and preferably located at a position not greater than one-third of a bay away from a standard. Joints in ledgers should be made using sleeve couplers.	
Ledgers should be fixed to standards with right angle couplers.	
Main guardrail should be fixed at least 950mm above every working lift, including ends. The space between any guard rails and toe boards should not exceed 470mm.	
Toe boards not less than 150mm high should be fixed on every working lift including ends and inside standards if they do not abut the wall.	
Transoms should be spaced at not more than 1.5m centres for 38mm nominal thick new boards (BS boards) and 1.2m centres for non-BS boards. This information is found on the tin strap around the end of the board.	
The distance between standards should not exceed: 1 8 metres for 3.0kN/m <sup>2</sup> (2 men and 400kg materials) 2.0 metres for 2.5kN/m <sup>2</sup> (2 men and 250kg materials) 2.1 metres for 2.0kN/m <sup>2</sup> (1 man and 350kg materials) 2.4 metres for 1.5kN/m <sup>2</sup> (2 men and 175kg materials)	
Lifts should not exceed 2.1 metres except that the first lift may be 2.7 metres.	
Ties securing scaffolds to the building should not be more than 8.5 metres apart (unless the scaffold is sheeted when the ties should be doubled in number), and on every other lift. All tie tubes should be secured with right angle couplers. If ties are not two-way, then adjacent transoms should abut the building.	
Ledger bracing is required at right angles to the building at alternate pairs of standards to the full height of the scaffold. Bracing can be zigzag or from outer ledger down to inner ledger or from outer ledger up to inner ledger or fixed to the standards with swivel couplers.	
Facade bracing is required to the full height of the scaffold at intervals not greater than 30m. Joints in continuous brace should be made with sleeve couplers and the brace should be connected to the transoms with right angle coupler or brace couplers. Swivels can be used to fix braces to standards.	
Working platforms should be close boarded (not less than 4 boards wide). Boards should butt and not overhang their end supports by more than 150mm. The inside gap near a wall should be as small as practicable.	
A tube supporting a gin-wheel should be secured at two points with right angle couplers and preferably braced. Lift load should not exceed 50kg. Maximum cantilever without brace 750mm.	



1) Name and address of the Company/Person on whose behalf the inspection was carried out

**Inspection Report**  
**Work at Height Regulations 2005**

2) Location of the work equipment inspected. (Site address)

Report of results of every inspection made in pursuance of regulation 12

Description of the work equipment inspected	Date and time of inspection	Details of any matter identified that could give rise to a risk to the health or safety of any person	Details of any action taken as a result of any matter identified	Details of any further action considered necessary	Name and position of the person making report	Date report handed over



## GUIDANCE NOTES - STEPLADDERS

Stepladders provide a free-standing means of access, but must be used carefully. They are not designed to take any degree of side loading and are relatively easily overturned. Most stepladder accidents are the result of human error, not the result of stepladders collapsing.

### DIFFERENT TYPES OF STEPLADDERS

All Stepladders should meet the requirements of the appropriate British or European standards.

1. BS 1129:1990 (British) applies to wooden ladders and stepladders.
2. BS 2037:1990 (British) applies to metal ladders and stepladders.
3. BS EN 131:1993 (European) applies to both metal and wooden ladders and stepladders.

In addition to the standards that relate to the material the stepladder is made from, there are three British and European standards that relate to their safe working loads:

1. Class1 (Industrial) - Maximum static vertical load 175 kg (27.5 stone).
2. Class 3 (Domestic) - Maximum static vertical load 125 kg (19.5 stone).
3. BS EN 131 - Maximum static vertical load 150 kg (23.5 stone).

Always check for the relevant standard when buying, hiring or using stepladders. If it is not marked on the stepladder, or detailed in the manufacturer's guidance, contact the manufacturer or supplier to ensure that the stepladder has been manufactured to the required British or European standard.

### ACTIONS - WHAT YOU MUST DO

#### PLANNING THE JOB

1. Do you have to use a stepladder?

Stepladders should only be used for uncomplicated work with a short duration. If a stepladder is not suitable then consideration should be given to the use of a ladder, scaffolding, tower scaffold systems, Mobile Elevating Work Platforms, etc.

2. Has a risk assessment of the task been undertaken? Questions to ask include:

- Are measures required to protect other people (e.g. barriers, second person to act as look out, etc.)?
- Will the stepladder be positioned on a level and stable surface (e.g. concrete)?
- How long will the task take?
- Have the person(s) carrying out the work received adequate information, instruction or training enable them to carry out the work safely?
- Do the person(s) carrying out the work suffer from vertigo or fear of heights?

3. Has the right stepladder been selected for the job?

Some stepladders may be too short for high work and some (just as dangerously) are too long for lower work. You must be able to work comfortably without over reaching up, down or sideways. Has the right class of stepladder been selected?

## **Before Use**

1. Always visually inspect a stepladder before it is used.
2. Check for damage to the stiles (the outside uprights), steps and top platform.
3. Check that the stays, hinges, chains or cords (used to keep the stepladder from spreading) are of sufficient and equal length and are in good condition.
4. Check that rubber or plastic non-slip feet are not missing (replacements can usually be obtained from the supplier or manufacturer).
5. Never use a stepladder that is defective. Do not attempt to repair damage. Always report damaged equipment immediately to your supervisor.
6. Make sure the steps are clean and dry. Beware of wet, greasy and icy steps.
7. Wear flat firm soled shoes/boots with clean soles and a good grip.
8. Check that there are no overhead hazards near where you are going to work, e.g. overhead electric lines.

## **Setting Up**

1. Always follow the manufacturer's instructions when setting up equipment.
2. Do not use, or carry metal stepladders (or wooden ladders when wet) beneath low power lines.
3. Check that the stepladder is locked into its correct position. Usually this will be with the legs positioned as far apart as the retaining cords/hinges allow.
4. Never use stepladders in the closed position.
5. Position the stepladder on a firm and level base. If you are working on soft ground, place the stepladder on a large flat board to provide a suitable base.
6. Always position at right angles to the work you are doing, i.e. when you climb up the stepladder you are naturally facing the wall or item you are going to work on.
7. If stepladders are used in front of a doorway, the doors should be securely wedged open. (Please note: Fire doors must not be left open when the immediate work area is unattended.)
8. Never have more than one person on the stepladder at any one time.
9. Do not use stepladders outside in strong winds.

## **On the Stepladder**

1. Always face the stepladder and use both hands when climbing up and down the steps.
2. If you need to carry tools up the steps use a shoulder bag, tool belt, etc.
3. Hold the stepladder with one hand while you work.
4. Always keep both feet on the steps whilst working. Never have one foot on the stepladder and your other foot on something else (e.g. wall, bookcase, window ledge, etc.).
5. Do not leave tools on steps where you could trip over them.
6. Never work from the top step of a stepladder, unless it has been specifically designed for this purpose and there is a secure handhold (always check the manufacturers guidance). As a general rule, keep your knees below the top step of the platform.
7. Do not use the rear supports of steps for foot holds.
8. Do not over-reach. Move the stepladder! Keep your body within the uprights while working.
9. Do not lend stepladders to non-company employees.

## **Storage and Records of Inspection**

1. Stepladders should be stored in a covered, well-ventilated place where they are protected from excessive damp, heat and the weather.
2. Wooden stepladders should be kept off the floor (to avoid contact with damp). Stepladders should not be stored on a position where they are hung from their stiles or rungs.
3. Stepladders should be stored out of sight, under lock and key.
4. As an alternative, if stepladders are stored in corridors, public areas, etc. they should be secured to a wall, or suitable actions taken to ensure they do not fall over.
5. A formal system should be instituted for recording stepladder inspections.
6. Visual inspections should be carried out before and after normal use. Inspections should also be carried out at other set intervals. The frequency of these set inspections will depend on the amount a stepladder is used.
7. As part of a system of inspection and maintenance, stepladders should be individually identified.
8. This identification may include marking or painting small areas of the stepladder. However, painting should be kept to an absolute minimum, as painting may hide defects.
9. Stepladders found to be defective should be clearly labelled or marked and withdrawn from service until repaired, or disposed of.

## **REFERENCES AND FURTHER INFORMATION**

'Safe Use of Ladders, Stepladders and Trestles', HSE Guidance Note 31 (General Series), ISBN 0-7176-1143-4.

'Health and Safety in Construction' HS (G) 150, ISBN 011-883594-7.

'The Stepladder User's Guide', DTI, DTI/PUB 2423/200K/9/96/R, URN 96/778.

'Assessment of the Safety of Stepladders', DTI Consumer Safety Research, DTI/PUB 2685/5K/3/97/R.

'Construction Site Safety, Safety Notes', CITB, ISBN 1-85751-006-2.



## GUIDANCE NOTES – DRIVING VEHICLES ON COMPANY BUSINESS

This Safe System of Work gives employers practical advice on how to reduce health and safety risks associated with driving company vehicles. It summarises employers' responsibilities and provides a checklist for employers and staff themselves.

Many injuries involved in vehicle driving can be avoided by following a few simple procedures.

The main risks involved driving include; RTA's, falling asleep at the wheel and distracted whilst driving.

### Driving Vehicles On Company Business Checklist

The following list of simple measures can be used by managers as a checklist to brief staff, or by staff themselves as a reminder of good practice.

#### Vehicle

Maintain your Vehicle



Conduct pre-driving inspection every time.



Be sure that scheduled maintenance checks are carried out in time.



Be alert to below-par performance of any equipment; have it attended to promptly.



Don't abuse your vehicle by driving too fast over bumpy terrain.



Don't make unnecessarily sharp turns or sudden stops and starts.

Ensure Vehicle is taxed and has current M.O.T. if applicable.

Engine Performance--Get engine driveability problems (hard starts, rough idling, stalling, diminished power, etc.) corrected at an authorized garage. Cold weather makes existing problems worse. Replace dirty filters--air, fuel, etc.

1. Fuel-- A petrol tank that is kept filled helps keep moisture from forming.
2. Oil--Change your oil and oil filter as specified in your manual--more often (every 3,000 miles) if your driving is mostly stop-and-go or consists of frequent short trips.
3. Cooling Systems--The cooling system should be completely flushed and refilled about every 24 months. The level, condition, and concentration of the coolant should be checked periodically. (A 50/50 mix of anti- freeze and water is usually recommended.) Never remove the radiator cap until the engine has thoroughly cooled!
4. Windshield Wipers--Replace old blades. If your climate is harsh, purchase rubber-clad (winter) blades to fight ice build-up. Stock up on windscreen washer fluid. Carry an ice-scraper.
5. Heater/Defroster The heater and defroster must be in good working condition for passenger comfort and driver visibility.
6. Battery--The only accurate way to detect a weak battery is with professional equipment. Routine care: Scrape away corrosion from posts and cable connections; clean all surfaces; re-tighten all connections. If battery caps are removable, check fluid level monthly.

7. Avoid contact with corrosive deposits and battery acid. Wear eye protection and rubber gloves.
8. Lights--Inspect all lights and bulbs; replace burned out bulbs; periodically clean road grime from all lenses.
9. To prevent scratching, never use a dry rag.
10. Exhaust System--Your vehicle should be placed on a lift and the exhaust system examined for leaks. The boot and floor should be inspected for small holes. Exhaust fumes can be deadly.
11. Cold weather will only make existing problems worse. A breakdown--never pleasant--can be deadly in the winter.
12. Tyres Worn tyres will be of little use in winter weather. Examine tyres for remaining tread life, uneven wearing, check the sidewalls for cuts and nicks. Check tyre pressures once a month. Let the tyres "cool down" before checking the pressure. Rotate as recommended.
13. Don't forget your spare, and be sure the jack is in good condition.

## **Driver**

Read your owner's manual

Obey the Law

Observe speed limits.

Obey traffic signs and signals.

Pass other vehicles only on the right; signal your intention before changing lanes.

Yield to drivers who have the right of way.

Never drive under the influence of alcohol or drugs.

Use your seat belt

Drive Sensibly and Defensively

Correctly position mirrors and seat before you start.

Never tailgate; use the '2 second rule'.

Don't insist on the right-of-way if the other driver will not yield it.

Dim your headlamps for oncoming cars and those ahead.

Be aware of what's happening several vehicle lengths ahead and behind you.

### **Expect the unexpected:**

- Reckless behaviour from other drivers
- People, or animals, darting into the road
- Swerving cyclists
- Potholes or debris in the roadway

Take bad weather precautions

### **Improve visibility:**

- Use wipers, defroster, and headlights.
- Counter glare from sun or snow with sunglasses.
- Clear snow from bonnet, roof, and *all* windows

### **Driving Safety**

When visibility is poor or roads are slippery:

- Reduce speed.
- Increase distance between you and the car ahead.
- Brake gently.
- Watch out for puddles, icy patches, and sudden pockets of fog.
- If you skid, steer gently into the turn. Do not use brakes or accelerate

### **Mobile Phones**

From 1 December 2003 an amendment to the Road Vehicles (Construction and Use) Regulations 1986 will mean that anyone driving a motor vehicle who is caught using a hand-held mobile phone will be subject to an on the spot fine of £30 (increasing to £1000 if the matter goes to court). Text messaging and using a hand-held with an earpiece or a microphone will also be banned. The Government are planning to introduce further legislation to make it an endorsable offence, i.e. three points on your licence, although no date has been set for this yet.

The Regulations currently require a driver to be in a position to maintain control of their vehicle at all times but the amendment will allow the police to stop anyone using their mobile phone whilst driving even though they may appear to be in control. The definition of driving within the Regulations includes situations where the vehicle is stationary but the engine is still running. In order to avoid committing an offence under this section, a driver will need to have parked and switched the engine off before using the phone.

### **Equipment**

You should keep these items in your car at all times, especially during long trips:

1. First Aid Kit
2. Blanket
3. Spare Fuses
4. Shovel
5. Engine Fluids
6. Torch
7. Flares/Reflective Devices
8. Tool Kit
9. Extra Fan Belt
10. Water
11. Fire Extinguisher
12. Battery Jump Leads
13. Duct or Electrical Tape
14. Jack/Wheel nut Wrench
15. Spare Tire (properly inflated)
16. Sand, Cat Litter (winter)
17. 'High-energy' snacks in glove box

# **GUIDANCE NOTES - WORKING AT HEIGHT - PREVENTION OF FALLS**

## **PREFACE**

Each year approximately 50 to 60 workers are killed as a result of falling from height and around 4,000 workers suffer serious injuries. In order to prevent deaths and injuries, key steps should be considered before undertaking any work at height.

## **PLANNING / HIERARCHY OF CONTROL MEASURES**

A place is 'at height' if a person could be injured falling from it, even if it is at or below ground level. The Work at Height Regulations require employers to avoid carrying out work at height where reasonably practicable. However, if work has to be carried out at height, all operations must be carefully planned and appropriately supervised. The particular hazards of each job must be identified and the best means of reducing those hazards considered. This must take into account those working or passing underneath the work area, as well as those employed on the task itself. The following key steps are to be considered:

1. If work at height can be avoided, it must be avoided - with careful planning it is reasonably practicable to conduct many activities safely from the ground;
2. Where working at height cannot be avoided, then steps must be taken to prevent falls by either working from an existing safe place of work (or gaining access by an existing means) or, if this is not reasonably practicable, by selecting the most suitable equipment for preventing a fall occurring. The risks and factors such as the duration of the work and the environment in which the equipment is to be used should be taken into consideration; and
3. If there is any remaining risk of a fall, steps must be taken to reduce the distance and consequences of a fall, for example by using fall arrest equipment; and
4. Training and instruction must be provided or other measures taken to prevent a person falling a distance liable to cause personal injury.

Risk assessment is the key to the proper planning and organization of all work at height and should assist in ensuring the selection of appropriate equipment for the task and its correct use. Equipment includes relevant machinery, tools, appliances, apparatus, installations, guard rails, barriers, working platforms, collective fall arrest devices (e.g. net or airbag), and personal fall arrest systems (e.g. ropes, harnesses, lanyards, fall arrestors).

The hierarchy of control measures is as follows:

1. First preference - prevent falls by working from an existing place of work (best thought of as anywhere where you do not need to use any extra work equipment to prevent a fall, i.e. a safe and fully protected place).
2. Second preference - prevent falls by using work systems comprising the most suitable equipment. Collective measures (e.g. guard rails, barriers) must be given priority over personal measures (e.g. restraint harnesses, lanyards).
3. Third preference - minimize the distance and effect of falls by using work systems comprising the most suitable equipment. Again, collective measures (e.g. nets or airbags) must be given priority over personal measures (e.g. fall arrest harnesses, lanyards). In minimizing the effect of a fall, it is not only the fall impact that needs to be considered, but also any other consequences; e.g. if working at height over water, it would be prudent to wear a lifejacket.
4. Fourth preference - Use work equipment that does none of the above (e.g. ladders, hop ups, etc.) but minimize the risk of any fall occurring through appropriate measures (e.g. supervision and training etc.).

## ACCESS

Suitable equipment shall be provided to give safe access to the working area, for example:-

5. Independent Scaffolds;
6. Tower Scaffolds;
7. Mobile Work Platforms;
8. Ladders.

Full details of the above are given in the relevant sections of this manual.

## SAFE PLACE OF WORK

The appropriate precautions shall be dictated by the type of work being carried out and the areas in which that work is taking place.

### Flat Areas

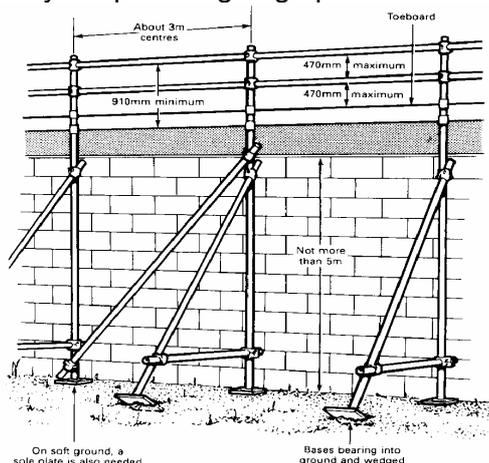
Work areas with a pitch of less than 10° can be considered to be flat.

Where the risk assessment identifies the potential of falling a distance liable to cause personal injury, edge protection is to consist of toeboards at least 150mm high, a main guardrail at least 950mm above the level of the working platform, and an intermediate guardrail or other rigid barrier so that there is not an unprotected gap of more than 470mm in height in the means of protection against a fall.

Where the area is large, and persons are not required to work near the edge, a simple barrier of crossed scaffold tubes supporting a single rail may be used to restrict the work area, providing that it is erected at least 2m from the edge.

All openings in the work area must similarly be protected.

Various ways of providing edge protection are illustrated on the following pages.

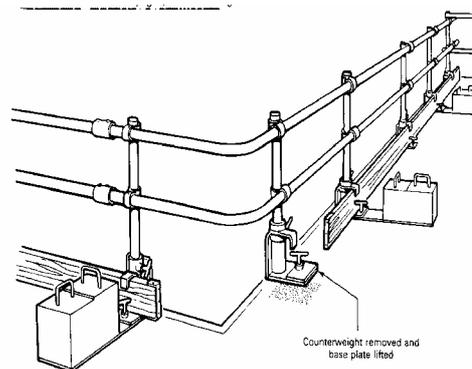
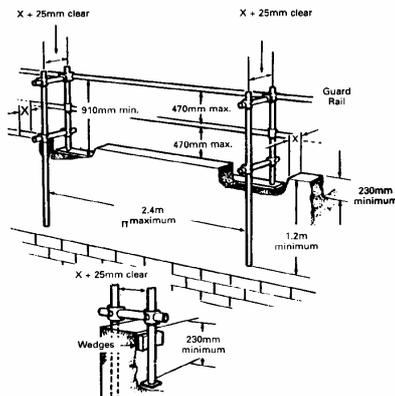


*Fig 1 Flat Roof Edge Protection: conventional tube and fitting supported from the ground.*

Where the working area is no more than 5m above ground level, scaffold tube uprights spaced at 3m centres are pitched from the ground. These are supported by raking shores and braced by longitudinal diagonal tubes in every fifth bay. Guard rails and toe boards are affixed to the uprights. (See Fig 1).

The arrangement shown in *Fig 2* is suitable for use along a roof edge which has an upstand, provided that the upstand is sound and strong enough.

Short inner uprights, standing on boards, as close as possible to the upstand and secured to the outer uprights by short horizontal tubes as shown, the lower tube being as close to the top of the upstand as possible. The inner uprights are to be wedged tightly with timber wedges, so that the outer uprights are tight against the side of the building for a distance of at least 1200mm below the top of the upstand. Uprights are to be spaced no more than 2400mm apart. The guard rails are fitted to the inner upright.



*Fig 2* edge protection along roof edge    *Fig 3* Flat roof edge protection: proprietary counterweight system

The system shown in *Fig 3* allows one of the counterweights to be removed, and the base plate raised to enable work at the edge to continue unhindered while the guard rail remains in position.

### Non-Fragile Sloping Roofs

On sloping roofs, unless suitable precautions are taken, there is the danger of persons slipping off the edge of the roof. Protection can be provided by:-

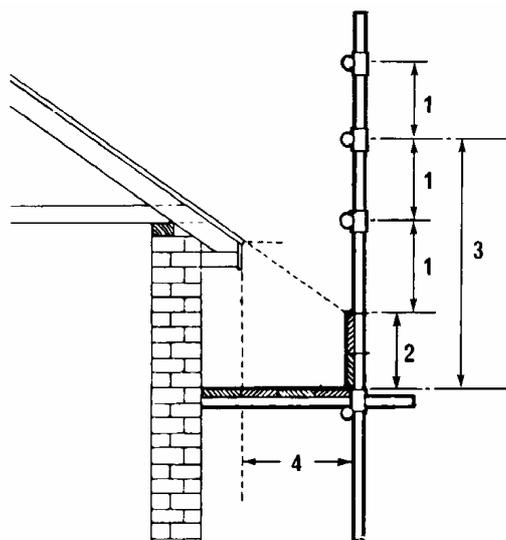
#### Barriers and Platforms:-

In this circumstance the guard rail is to be not less than 950mm above the uppermost scaffold board. There must be no gap greater than 470mm. Where the top lift of a scaffold is used to provide a catch barrier, the following dimensions are used:-

1. Not less than 470mm
2. From lower guard rail to top of barrier to be not more than 470mm;
3. Top of catch barrier to take the roof line but not less than 150mm;
4. Height of lower guard rail to be not less than 600mm from platform;
5. Standards to be not less than 600mm from roof edge line.

The working platform is to be not more than 300mm below the eaves and is to extend three boards beyond the line of the roof edge.

The guard rail (1) is to be 950mm above the platform and the toe board (2) is to be of at least 150mm.



### Roof Ladders:-

On most sloping roofs suitable roof ladders or crawling boards are essential. For minor works, where edge protection is not used, ladders are always to be used.

Roof ladders and crawling boards are to be purpose made for the job. They are to be strong enough to support persons when spanning across the supports for the roof covering and be secured or positioned to prevent movement. They are to be a minimum 600mm wide.

Figure 5 catch barrier

The anchorage at the top of the ladder or board is not to rely purely on the roof capping, as this may break away. The anchorage is, wherever possible, to bear on the opposite slope.

Eaves gutters are never to be used as a footing or to support a ladder as they are not strong enough.

### Curved or Specially Shaped Roofs

The appropriate precautions shall depend on the size and shape of the roof. Platforms for curved roofs can be provided by the use of scaffold tubes and fittings, arranged to follow the contours of the roof, by specifically designed mobile scaffolds, by adapting suspended scaffolds or by using power-operated mobile work platforms.

### Non-Fragile Industrial Roofs

Eaves and gable ends are to be protected with suitable guard-rails and toe boards. If valley gutters are used for access, prior to decking being laid, these are also to be protected. Precautions, such as the use of a safety harness attached to a suitable anchorage, are to be taken during the erection of the protection.

The leading edge, created during sheet laying, also requires protection and the use of a safety net is the HSE's preferred method of achieving this.

Where the continuous use of safety nets is considered impracticable, steps will be taken to reduce the risk of falls, during the planning stage, by using a system of installation which does not require employees stepping or leaning over the edge of the protected area. Consideration is to be given to the provision of a suitable working platform on the purlins and/or use of a safety harness.

Light weight staging can be used to provide protection at the leading edge. This can also be used to assist the prevention of the need to step out over an unprotected area. Care should be taken in positioning the staging as the work progresses. Proprietary purlin trolley devices are available which enable staging to be moved along the purlins and to be joined end to end.

Where staging is used as a walkway or as a working platform, guard-rails and toe boards must be fixed at the edge away from the roof decking. Staging is also to be secured to ensure that it will not tip, should anyone lean on the guard-rail. Where it is used as a working platform the staging is to be a minimum width of 600mm.

Non-fragile industrial roofs often contain fragile components, such as rooflights, and these are to be covered or protected and the approach to them is to be signed.

### **Fragile Roofs**

Before any roof is used as a means of access or a place of work it is essential to identify areas covered with fragile materials and to decide on the precautions to be taken. Fragile is defined as any roof or item placed in a roof e.g. a roof light that would give way under the weight of any one working on it and takes into account the weight of anything that they may be carrying or holding.

On all roofs covered with fragile material, roof ladders or crawling boards are to be used. The number of ladders or boards will depend on the type of work being carried out. A person must never need to step onto a fragile roof in order to move the ladder or boards.

The provision of edge protection for fragile roofs is as detailed in the previous sections, but greater consideration needs to be given to the suitability of the protection with regard to the strength of the supporting material.

### **SAFETY HARNESES, BELTS AND NETS**

The primary aim is to be the provision of a safe place of work. However, this is not always practicable. In such cases the use of safety belts, harnesses or nets may be appropriate, providing that suitable anchorage points are available and employees are supervised to ensure that belts or harnesses are worn at all times. Inertia reel systems, which give employees a greater freedom of movement, are available.

### **WEATHER CONDITIONS**

The effect of adverse weather conditions must be anticipated and suitable precautions taken. Rain, snow and ice can all serve to make the roof slippery and the work area should be inspected after any of these to ensure that it is safe. Windy conditions can also be dangerous, particularly whilst carrying materials. Work shall not be allowed to continue in high winds.

### **PROTECTION OF THE PUBLIC**

Members of the public or other contractors' employees are to be protected from falling material during construction. This may entail the use of "brick guards", fans or other similar precautions. Consideration is to be given to the provision of sheeting to enclose the work area and boarding to prevent materials falling through any gaps in the working platform or area. Barriers at ground level may also be necessary, to keep the public away. Particularly stringent precautions are to be taken when children are at risk.

Waste material is to be lowered to the ground in skips or baskets or disposed of in enclosed chutes. Throwing such materials from the roof or scaffold is strictly prohibited unless the security of the target area can be ensured.

## **INSPECTIONS**

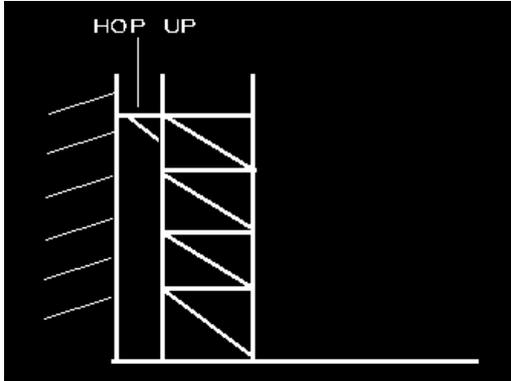
As far as it is reasonably practicable to do so, every place at which work is to be carried out at height is to be checked by a competent person on every occasion before that place is used.

Guardrails, toe-boards, barriers, working platforms, scaffolding, nets, airbags or other collective fall arrest equipment, personal fall protection equipment and ladders are to be inspected in position after installation or assembly before anyone is permitted to use them. Additionally, they are to be inspected as often as is necessary to ensure safety, and in particular to make sure that any deterioration can be detected and remedied in good time.

All structures temporarily erected as working places are legally defined as scaffolds. They are, therefore, to be subjected to inspections as if they were scaffolds. The place of work must be “safe” prior to work commencing. This will require some sort of inspection. The place must be formally inspected and the findings recorded in a record of inspection at least every 7 days and after any event which may affect the safety of the working place. This requirement also applies to mobile platforms.

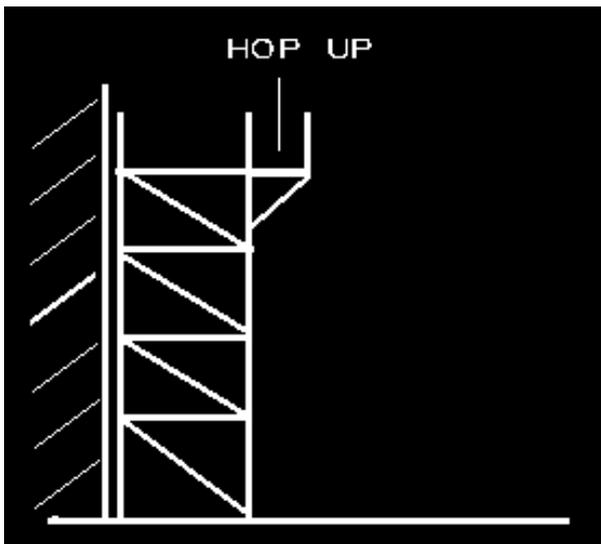
## GUIDANCE NOTES - HOP UPS

A hop up bracket or extension bracket is a bracket that is attached, usually to the inside of a scaffold, to enable boards to be placed between the scaffold and the structure (as shown in *Figure 1*).



*Figure 1 Hop up bracket installed between a building and a scaffold*

However, it is often used to extend the scaffolding outwards (as shown in *Figure 2*).



*Figure 2. Hop up bracket installed outside the scaffold*

Hop up brackets are not designed to support heavy weights and should, therefore, only be used for the passage of persons or as a working platform. They are never to be used for the storage of materials, even for a short period.

As the bracket forms a part of the scaffold, it is to meet all the requirements of a working platform, in that it is to be:

- Fully boarded;
- Provided with a toe board;
- Provided with double guardrails;
- Inspected as part of the scaffold, as detailed in the section "Scaffolds".

