

SAFE SYSTEMS OF WORK MANUAL

GENERAL SITE MATTERS AND WELFARE

The Company will provide plant, equipment, advice and training necessary to ensure that safe systems of work are adopted.

Supervision will be such that no unsafe practices are condoned.

Any defects observed in plant, equipment or tools must be reported without delay to a supervisor for remedial action to be taken to effect a repair or replacement.

When on site or in offices, check the site layout and seek guidance from the site manager on health and safety arrangements and site rules. Note the location of the first-aid facility. If a method statement has been prepared, ensure that all persons working under our control are made aware of the contents and understand their individual responsibilities.

Operatives in having the legal duty to co-operate with their employer, **MUST** bring to their supervisor's notice any dangers that they have observed such as unsecured ladders, faulty scaffolds, dangerous electrical equipment, etc.

No person should unnecessarily approach unprotected roof or floor edges. Similarly, fragile roof coverings and roof-lights, unprotected floor openings and stair-wells, etc., are extremely dangerous and result in the falls of many operatives, causing serious injuries.

Always maintain a clean and tidy work-area. Bag up waste material or use a proper waste receptacle (builders skip, etc.). The throwing down of material is not permitted; a hoist or chute must be used.

A sufficient number of sanitary conveniences must be provided in convenient locations and maintained in clean condition. Each sanitary convenience must be provided with washing facilities as described below.

Washing facilities must: -

- a. Be of sufficient number.
- b. Be located in the immediate vicinity of sanitary conveniences and changing rooms.
- c. Include hot & cold (or warm) water (preferably running water), soap and towels.
- d. Wash hand basins must be large enough to allow persons to wash & rinse hands & forearms thoroughly.

Drinking water must be provided on all sites. The supply must be conspicuously marked and cups made available (unless a drinking fountain is provided).

Accommodation for the storing and drying of clothing must be provided.

Where special clothing is required for work, changing facilities must be provided.

Rest facilities must be provided which: -

- a. Protect non-smokers from discomfort caused by tobacco smoke.
- b. Include provision for the preparation and consumption of meals.
- c. Include the means for boiling water.

SAFE USE OF ABRASIVE WHEELS

Legislation

Provision and Use of Work Equipment Regulations (PUWER)
Personal Protective Equipment Regulations
Noise at Work Regulations
Electricity at Work Regulations
COSHH Regulations

Hazards

- * Particles in eyes/loss of sight - most severe.
- * Body contact with wheel/severe laceration - most common.
- * Bursting wheels - could cause multiple injuries.
- * Fire - sparks are a source of ignition.
- * Fumes (Petrol - Carbon Monoxide).
- * Electric shock (110v & 240v).
- * Dusts (Silica etc.).
- * Vibration - Vibration White Finger.
- * Noise - machines usually emit more than 90 dB(A) - this could cause hearing loss.

Causes

- * Incorrectly fitted Wheel.
- * Lack of training.
- * Horseplay.
- * Lack of maintenance.

The following procedures must be followed by all staff and operatives:-

Ensure that the machine has been thoroughly examined within the last 12 months. The thorough examination certificate must be available at the workplace.

NO person shall mount an abrasive wheel onto a spindle unless proper training has been received and a "Certificate of Competence" has been issued to the operative concerned.

A proper guard must be fixed and kept in position over every abrasive wheel or disc. The guard should cover the whole of the wheel or disc except for that part necessarily exposed to do the work.

Depressed-centre wheels/discs available only with a reinforced resin bond are used on portable grinding machines for dressing the face of a workpiece. These may also be used for cutting-off.

Reinforced wheels and discs for cutting stone, concrete, brickwork, metal, etc., should be used on portable machines and mounted between the following flange sizes:

WHEEL/DISC SIZE	FLANGE SIZE
Over 100mm and up to 230mm	39mm minimum
Over 230mm	not less than 1/3rd diameter of wheel

For cutting metal on FIXED machines, flange sizes may be reduced to one quarter wheel diameter .

All discs MUST be kept in a dry location and stored flat. Hanging discs on a nail is NOT permitted. Do not expose discs to chemicals.

The correct spanner / key must be used for removing the retaining bolt.

For electric machines, ensure the power source is isolated before inspecting the machine or changing the wheel.

Petrol driven machines must be switched off.

Select correct wheel for job - stone or steel ? (Stone will cut steel - steel will not cut stone).

RPM - must be greater on wheel than on machine.

Clean out the inner part of the guard before fitting a new wheel.

Check that the wheel moves freely before starting.

Underfoot conditions should be flat and level to prevent slipping.

Ensure sparks do not ignite combustible material or flammable substances.

Report any defects to the Foreman immediately.

Ensure that no person is standing directly behind or in front of the work activity.

For prolonged work with abrasive wheels, a specific vibration assessment may be required

Personal Protective Equipment

Eye protection MUST ALWAYS be used when operating Abrasive Wheels.

Wear hearing protection.

Gloves should be worn to provide protection to hands and reduce exposure to vibration.

Wear safety footwear.

CARTRIDGE OPERATED FIXING TOOLS - (COFT)

No person must use a cartridge fixing tool unless properly trained in their safe use and in possession of a valid Certificate of Competence.

No person who is COLOUR BLIND should be permitted to operate a COFT.

Before accepting a COFT from store, check that it is NOT loaded.

When inserting cartridges, check that the correct propellant charge is being used. Reference to the label on the cartridge box will indicate its relative strength.

Insert a strip of cartridges with the barrel pointing away from you and other persons.

NEVER place a hand over the end of a barrel.

Do NOT walk around the site with the COFT when loaded.

ALWAYS hold a COFT at right angles to the work when fixing, and ensure that the splinter guard rim is in contact with the working surface, over the whole of its perimeter. When fixing into concrete, use a "spall-stop".

Operatives MUST wear eye protection, hearing protection and a safety helmet when using a COFT.

If a misfire occurs, wait one minute before unloading. Cartridge extraction must be carried out as per the manufacturer's instructions. On no account should a screwdriver, nail or knife be used.

All misfired cartridges, including those in strips, MUST be immersed in water to render them harmless. They should NOT be thrown into waste bins or skips for removal.

No COFT should be used in a work-place where there is a risk of explosion or fire due to flammable vapour or dust.

Always carry out a preliminary test on the material to be fixed, to determine the correct cartridge strength. Ensure that no-one is allowed behind the material being fixed.

Stocks of cartridges should be stored in a dry cupboard in a flame-proof lockable box. For security reasons, no COFT or cartridges should be left unattended and site supervisors MUST ensure that tools and cartridges are kept locked away separately when not in use.

For significant use, a specific vibration assessment may be required

COMPRESSED-AIR HAND-TOOLS

Compressed-air tools are driven by air under high pressure and can be exceedingly dangerous, causing severe rupturing of internal organs, leading to death if the air enters the body. Under no circumstances should horseplay with compressed air be condoned. The following system of work must be followed at all times when using compressed-air tools:-

The compressor **MUST** be under the control of the supervisor. It must be sited outside buildings to prevent a build-up of exhaust fumes.

All guards for the V-belt pulley and pulley drive must be in position.

The oil feed to the air line must be kept topped-up.

When running, the engine side doors must remain closed to reduce noise emission.

Air receivers must be marked with means of identification and with the safe working pressure. They must be fitted with a safety valve, pressure gauge, drain cock (and manhole where applicable).

Air receivers must be cleaned out and be **THOROUGHLY EXAMINED**, at periods specified by a competent person (usually an Insurance Company Engineer/Surveyor).

All compressed air hoses must be regularly inspected for damage and deterioration. The hoses must be kept as short as possible and be protected from traffic. Hoses must be kept clean when disconnected.

All connections must be properly clamped. Safety devices should be used, which restrain connectors in the event of a blow-off. Double lock couplers may also be used.

For temporary stoppage of the air flow it is **NOT** permissible for the hose to be bent or kinked or wired up to stop the air flow. The air supply should be shut off at the compressor valve.

All air-tools must be properly maintained. They require clean air and proper lubrication. In every air line there should be an efficient filter and lubricator.

Good ventilation is necessary when using air-tools because the oil mist can cause offensive, if not dangerous, atmospheres in confined spaces.

Hand-tools should be held firmly to prevent spinning and/or jumping, and firm pressure should be maintained in the same way when starting and stopping, so that no damage can be caused to the operator's hands or feet.

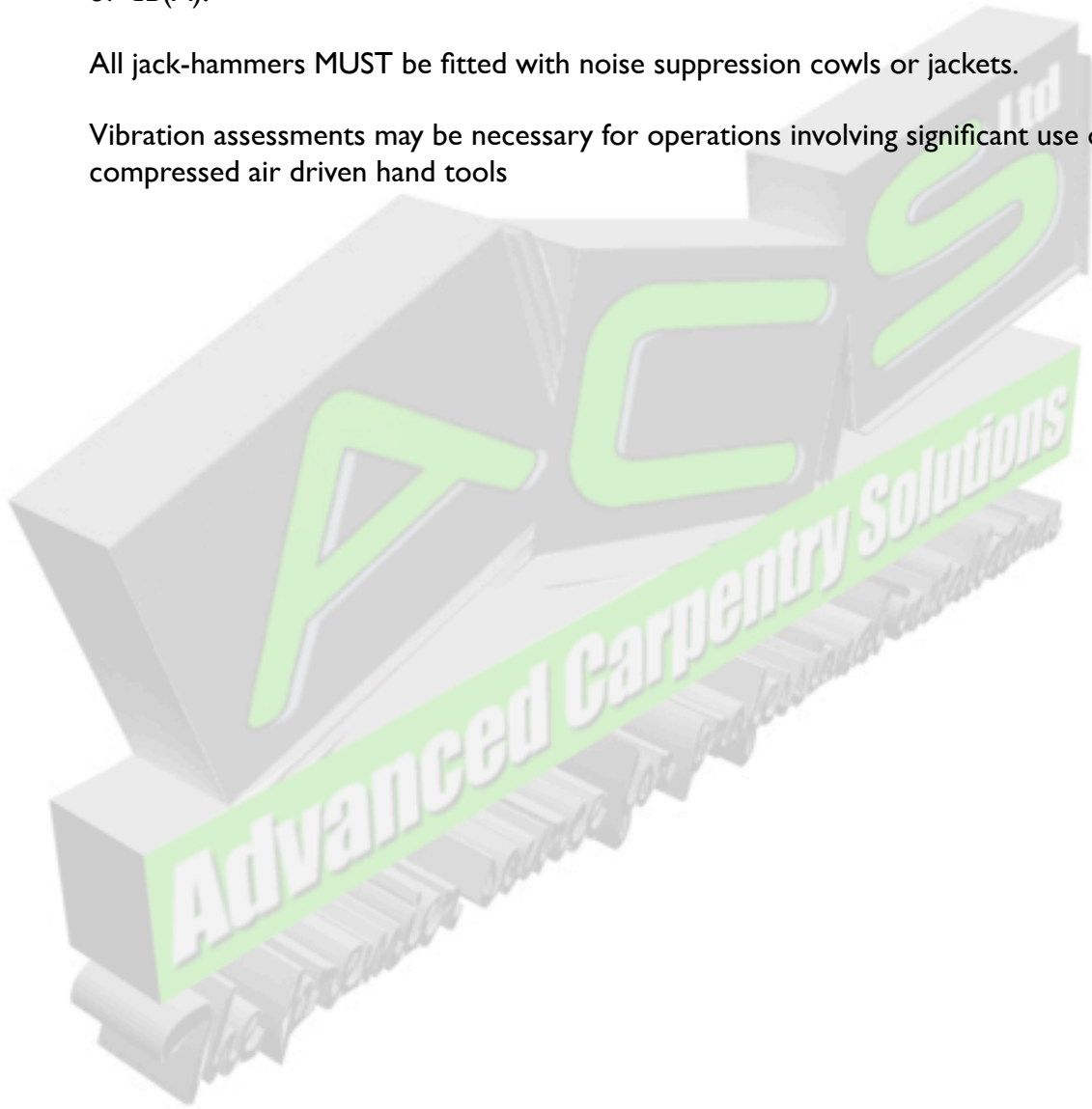
In cold weather pneumatic tools may freeze up. An anti-freeze lubricant in the regular oil-fog lubricator fixed in the air line, usually on the compressed air outlet, will overcome the problem.

When using a concrete breaker, the retaining pin **MUST** be securely in position to prevent the point dropping out. Pick points should be kept properly sharpened, so as to prevent skidding. The end should be periodically heat-treated, because over a period of time the temper of the metal is reduced and the end can break off and severely damage the operator's feet.

All operatives using tools driven by compressed air **MUST USE** safety footwear, eye protection **AND** hearing protection, because the noise emission is usually over 87 dB(A).

All jack-hammers **MUST** be fitted with noise suppression cowls or jackets.

Vibration assessments may be necessary for operations involving significant use of compressed air driven hand tools



ELECTRICITY (General)

OVERHEAD CABLES

Overhead lines can cause fatalities/serious injury if touched by a crane jib, hoist rope or by a scaffold tube, metal ladder, etc. It is possible to create danger by near contact causing "Flashover" during the course of the work.

Before work commences a Risk Assessment must be carried out to decide on the best method of protecting persons at work, either by a phased shut-down, diversion or the erection of suitable height restriction barriers.

The barriers must be of substantial construction with plastic flags strung between the tubes. Warning notices are also required at ground level at the approaches to the 'O/H' lines. Seek advice from the area Electricity Authority on safe distances.

Scaffold tubes must not be used as barriers.

DISTRIBUTION

Electricity distribution for site temporary supplies must comply with BS 4363:1968. Plugs, socket outlets and couplers must be either sprayproof or waterproof.

INSTALLATION

ALL electrical work MUST only be undertaken by qualified electricians. Unauthorised tampering with electrical equipment or the installation is NOT permitted. The changing of a plug may be carried out with the permission of a supervisor, who should then check the fitting.

The following constitutes good practice and should be used as a guide:-

- a). Every joint in the system MUST be of safe construction so as not to present a danger.
- b). All electrical conductors must be suitably covered with insulation material. Where cables are not ducted or buried, the installer shall install danger signs, state the voltage and that the cables are live.
- c). Where possible switches which control the supply of power to apparatus should be of a type which can be locked in the "OFF" position, particularly if the isolator is not visible from the apparatus, or because the Switch Room cannot be locked.
- d). The system MUST be correctly earthed and the correct fuses and/or circuit breakers used.

TESTS AND COMMISSIONING - CERTIFICATE REQUIRED

Before a supply or temporary supply is brought into use, it must be tested and commissioned by the installer and a "Completion Certificate" provided. This Certificate must be kept on the site for perusal by the Enforcing Authority and the Company Safety Officers.

CHECKING THE ELECTRICAL SYSTEM

All electrical installations and equipment, together with portable electric appliances and tools on sites and in other premises (e.g. Offices, Workshops, etc.) must be properly maintained, inspected and tested on a regular basis by a competent person. A record should be kept of the inspections and tests. Sub-Contractors are under a similar obligation to ensure that this policy is carried out.

WORK AND MAINTENANCE ON THE ELECTRICAL SYSTEM

Every electrical work activity, including maintenance, which may give rise to possible danger, must be carried out with the system made dead, unless it is absolutely necessary for the system to remain alive. In the latter case, a "Permit to Work System" should be operated.

ELECTRICALLY POWERED PLANT

All stationary plant (Circular Saws, etc.) should be supplied by armoured cables.

ELECTRICAL TOOLS AND EQUIPMENT

All electrically operated tools and equipment, either on loan from within the Company or hired in, should be delivered with a "Tool/Equipment INSPECTION Certificate". This must be stated as a requirement when ordering. In addition:-

- a). Portable hand tools MUST be either battery powered or 110 volt, with step-down transformers centre-tapped to earth. The only exception to this requirement is on the express permission of the site supervisor, when the supply of 110V is impracticable.
- b). All plug grips must cover the outer insulation sheathing of cables and NOT just the conductor wires.
- c). Any defect in the installation, or in the plant or equipment, noted by employees must be immediately reported to the site supervisor.
- d). No radios should be permitted on any site unless with the express permission of the site supervisor. No radio which has been adapted to operate with a step-up transformer (from a fluorescent lighting fitment or similar), stepping-up the voltage from 110V to 230V will be allowed.
- e). Electricity cables for portable equipment should be strung up clear of access routes so as to prevent danger and damage to the cables.
- f). Electricity cables and equipment should NOT be subjected to, or remain in, wet areas unless suitable precautions are taken to avoid danger.

GENERATORS

Generators with petrol or diesel engines, must be sited in an external location so as to ensure engine fumes are adequately dispersed. The generator must be inspected to ensure that all covers are securely fixed and that no live terminals are exposed.

Where indicated by the manufacturer's instructions, generators must be suitably earthed.

WORK AT HEIGHT - (General)

The Work at Height Regulations 2005 came into force on 6th April 2005. They replace all earlier regulations regarding work at height, including the sections relating to work at height contained within the Workplace (Health, Safety and Welfare) Regulations 1992 and the Construction (Health, Safety and Welfare) Regulations 1996 (since replaced by CDM).

Work at height is defined as being any place where a person could be injured as a result of falling from it - even if it is at, or below, ground level.

Employer's Duties

This company accepts its responsibilities as a duty holder, i.e. as an employer and when in control of work undertaken by others. Our responsibilities are;

- To properly plan and organise all work at height (including contingencies for emergency situations);
- To ensure that work at height takes account of weather conditions that may endanger health and safety;
- To ensure that those involved in planning and carrying out work at height are trained and competent;
- To ensure the place where work at height is to be carried out, is safe (including access to the workplace and egress from it);
- To ensure that work equipment used for work at height is appropriately inspected;
- To ensure risks from falls through fragile surfaces are properly controlled;
- To ensure risks from falling objects are properly controlled.

Work at height must be risk-assessed in all cases, in accordance with the requirements of the Management of Health and Safety at Work Regulations.

Hierarchy of Controls

The following hierarchy of measures must be adopted for all work at height:-

1. The need for work at height must be minimised so far as is reasonably practicable. Work should not be undertaken at height if it can be carried out safely by other methods.
2. Appropriate work equipment or other measures must be used to prevent falls where working at height cannot be avoided. (e.g. guard rails and toe boards)
3. Where the risk of a fall cannot be eliminated, work equipment or other measures must be used to minimise the distance and consequences of a fall. (e.g. safety nets or soft landing systems)

Selection of protective equipment

Collective protection measures must be given priority over personal protection measures when selecting equipment for work at height. For example, the installation of guardrails would protect all persons working at height, whereas a safety harness would only protect the individual wearing it (and its effectiveness would rely on the user clipping on correctly).

Inspections

Inspections required by these Regulations vary according to the work equipment being used and the type of work being undertaken. More details are contained in the relevant pages this manual and in the schedules appended to the Regulations.

The requirements for inspections are in addition to those that may be required by the Provision and Use of Work Equipment Regulations (PUWER) and the Lifting Operations and Lifting Equipment Regulations (LOLER).

'Inspections' are defined as *'such visual or more rigorous inspection by a competent persons as is appropriate for safety purposes....(including) any testing appropriate for those purposes'*.

Each individual place of work at height must be checked on every occasion before the place is used. This will include its access, surface, guardrails, etc.

The following items must be inspected after assembly or installation and as often as is necessary to ensure safety, in particular to make sure that any deterioration can be detected and remedied in good time;

- Guardrails
- Toe-boards
- Barriers
- Working platforms
- Ladders
- Safety netting
- Etc.

The top guardrail or other similar means of protection must be at least 950mm above the edge from which persons could fall, although a height of 1000mm is recommended.

Employees Duties

All employees are required to report to their employer any activity or defect relating to work at height which is likely to cause danger. Employees are also required to use any work equipment or safety device provided for work at height in accordance with training and instruction they have received. These are in addition to the general duties placed on employees by other legislation, including the Health and Safety at Work etc. Act 1974

LIFTING APPLIANCES

"Lifting Appliances" are defined by as a crab, winch, pulley block or gin wheel, hoist, crane, sheer legs, excavator, drag-line, piling frame, aerial rope-way or overhead runway.

No person under the age of 18 years must operate a crane or other mechanically propelled vehicle unless under the immediate supervision of a competent person.

Cranes must only operate in level conditions with out-riggers fully extended and with timber bearers as packing used in adverse ground conditions.

All lifting appliances must be properly maintained and any defects likely to cause injury or other mishap must be reported to the site supervisor without delay. No machine should continue to be used until defects likely to cause an accident or dangerous occurrence, have been rectified.

No lifting appliance must be overloaded and the weights of loads should be determined before lifting.

All safe load indicators must be in good working order with the correct cam fitted (if relevant).

When the load is not in the operator's vision, a competent banksman, or banksmen, must be in charge of the operation. Operators must not raise any load unless satisfied that correct signals are being given.

All loads must be lifted vertically.

Where the movement of the load may be affected by the wind, tail ropes must be fitted and used.

No crane or other items of plant should be moved under, or work near overhead electrically charged lines unless adequate protection has been provided to the lines, so as to prevent accidental contact.

Cranes should not travel across a site with a load suspended from the hook.

No person should remain under a load being raised.

At all times, clearance of not less than 610mm (2ft) must be maintained between any part of a crane or other machine with a slewing motion, particularly between rear ballast and any obstruction.

When dual lifts by cranes are planned, the following procedure **MUST** be followed:-

- The lift must be properly organised with a competent person in charge.

- Cranes must be of identical capacity and preferably of the same type.

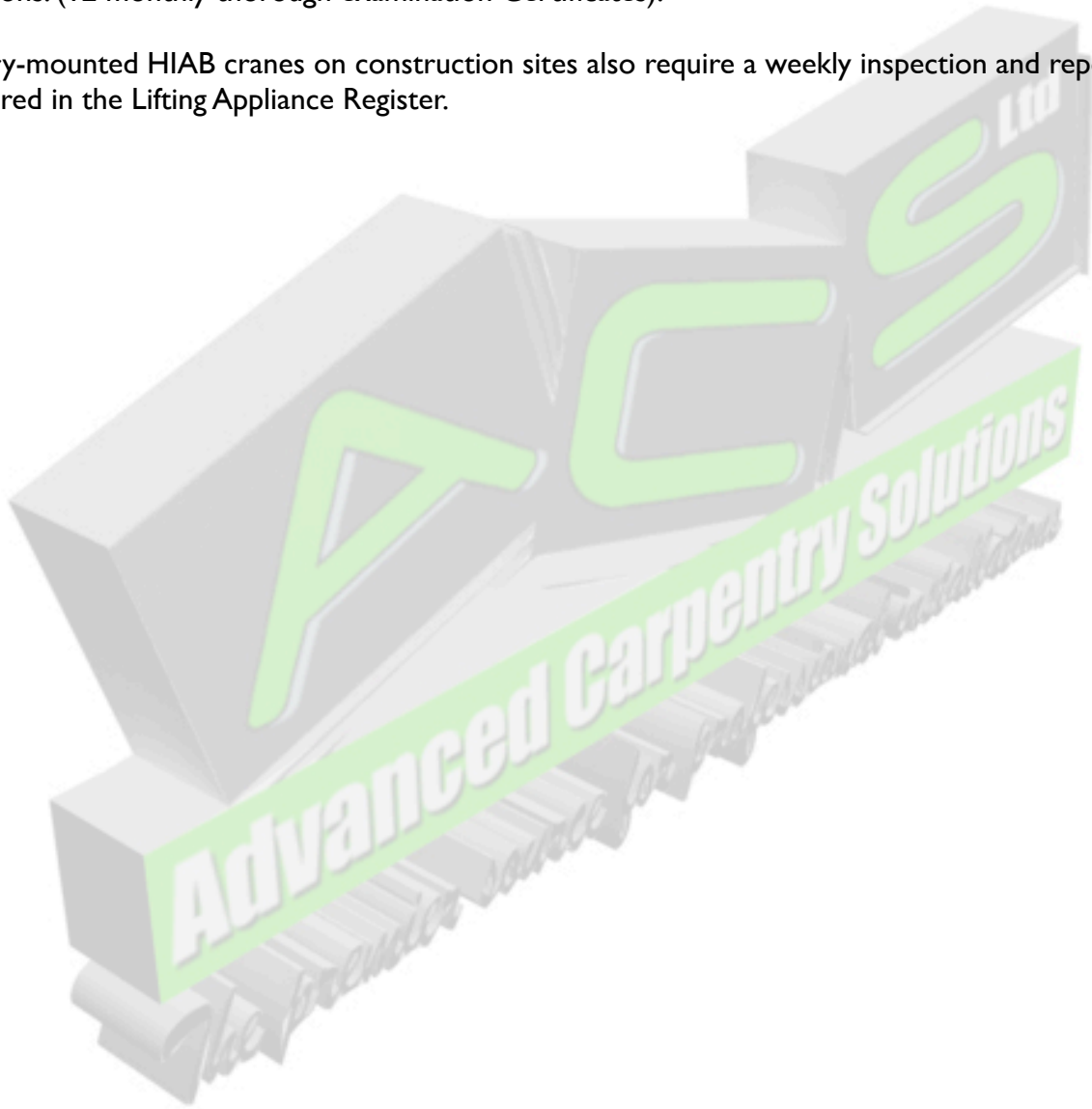
- The safe working loads of the cranes to be used in the lifts must be reduced by 25%.

All crane and other plant operators **MUST** be in possession of a Certificate of Competence issued by Construction Skills or another recognised authority.

Weekly inspections of all lifting appliances must be carried out by a competent person (usually the operator) and a report of the result of each inspection must be entered in the Register of Lifting Appliances.

Each operator must ensure that all current certificates of thorough examination and test are available, together with the Lifting Appliance Register for perusal by clients or other authorised persons. (12 monthly thorough examination Certificates).

Lorry-mounted HIAB cranes on construction sites also require a weekly inspection and reports entered in the Lifting Appliance Register.



LIFTING GEAR

"Lifting Gear" is defined as a chain sling, rope sling (or similar gear) and a ring, hook, plate clamp, shackle, swivel or eye-bolt.

All chains, ropes and other lifting gear must be **THOROUGHLY EXAMINED** at least once in **ONCE IN EVERY 6 MONTHS** of use and all lifting gear other than fibre slings must be **TESTED** and certificated **BEFORE USE** and after repair.

An accurate record must be maintained on-site of all lifting gear whether actually in use or retained in the store. It is recommended that such items be listed in the a register.

All lifting gear must be marked with some means of identification for checking purposes and be marked with its safe working load.

Hang up fibre ropes in the stores, to avoid contamination with oil, moisture, etc.

Keep wire ropes correctly lubricated and rust free.

Check welds in chain links, and at splices and thimbles on wire ropes and examine any unusual marks.

Unroll coils of wire rope. Never pull a wire rope out of the centre of a coil or kinks will appear.

Lifting gear made of wrought iron must be annealed periodically, else it will become dangerously brittle due to work hardening.

Slings must never be knotted or shortened by the use of bulldog clips.

Never hammer a chain link to straighten it. Send the chain to a specialist for repair.

Odd bits of chain, rope, wire bands, etc., left lying around should not be used as lifting gear.

Only use properly tested and marked gear.

Never exceed the safe working load of any lifting gear.

When securing a load with a sling, all legs of the sling must be used. It is safe practise to restrict the angle between the legs to 90 degrees.

Improvised or home-made slings must never be used.

All portable lifting appliances, e.g. chain blocks, must be strong enough for the job and be securely fixed. The structure to which they are fixed must be strong enough to hold them.

Slings passing over sharp edges, such as joist flanges, must be suitably packed. Fixing clamps are more suitable and safer. They can be fitted quickly and are so designed that they cannot come off whilst the hook of the lifting appliance is in position.

Slinging of Scaffold Pallets. - These pallets are designed to be lifted either by placing forks or slinging chains under the bearers. They are **NOT TO BE LIFTED** by attaching chains to their legs which is a dangerous practise and must **NOT** be permitted.

Slings and chains must never be used for towing.

Scaffold lashings must NOT be used as slings as they are not certificated.

All hooks must be fitted with a safety catch unless they are of the "C" type. Where safety catches are damaged, the mouth of the hook may be moused as a temporary measure.

Bulldog Clips - When fitting clips, the U-Bolt should always be on the tail end (or dead end) of the rope and the saddle on the tension part.

The correct number of clips to be used are:-

<u>ROPE DIAMETER</u>	<u>NO. OF CLIPS</u>
Up to & inc. 3/4" (19mm)	Not less than 3
Over 3/4", up to & inc. 1.1/4" (32mm)	Not less than 4
Over 1.1/4", up to & inc. 1.1/2" (38mm)	Not less than 5

Clips should be set approximately six rope diameters apart, and should all be set the same way.

Eye Bolts - Eye bolts should be fully screwed down to the shoulder. The angle between the legs of a sling fitted to eye bolts should not exceed 90 degrees. It is advisable to consult the manufacturer's recommendations regarding maximum working loads.

SLINGING OF LOADS

To ensure proper control of lifting operations, the following procedures must be adopted:

A trained and competent person must supervise the operation.

Ensure that the correct lifting gear and packings are available before the operation commences.

The lifting gear must be visually checked for defects and that the SWL is clearly marked on each item of gear to be used.

Check that the standard crane signals to be used are understood by both the crane operator and slinger.

Ensure that the weight of the load is established before lifting commences.

Multiple slings must be connected by a ring or shackle - a spreader beam must be used for large loads.

Remember that "doubling-up" a sling, does NOT double the SWL.

All loads must be lifted vertically, with the hook positioned directly above the centre of gravity of the load.

Before lifting, ensure that the load is free and that no slack sling legs are evident.

Pack sharp edges with timber or other suitable material so as to avoid damage to slings, etc.

Directly before a full lift, raise the load slightly to check that all slings, etc., are taut. The load must not be snatched.

Tag lines must be used to stabilise long or large loads, especially in windy conditions.

No person is permitted to ride a load being raised or lowered.

Ensure that no person is under a load being lifted or lowered.

The load must be landed onto battens to prevent damage to slings and to allow easy removal.

TYPES OF SLINGS AND SAFE WORKING LOADS

This list applies only to slings where the angle between the sling legs is LESS than 120 degrees.

Single and double legged chain slings - SNICKLED. (i.e. secured on its own chain).
SWL = 50% of that marked on sling.

Reeving sling (i.e. one eye threaded through the other).
SWL = 50% of that marked on sling.

Twin reeving slings.
SWL = 62.5% of that marked on the sling.

Double legged chain sling.
SWL = That marked on sling.

Back-hooking sling (i.e. single chain and hook, hooked back onto eye)
SWL = That marked on sling.

Cradle sling (i.e. four legged sling composed of two single wire rope slings).
SWL = Twice that marked on sling.

Halshing sling (i.e. one rope with both eyes reeved through its loop and attached to hook).
SWL = That marked on sling.

Double wrapped sling (i.e. two wire ropes, each wrapped with all 4 eyes on hook).
SWL = Twice that marked on single sling.

FOR SLINGS WHERE THE ANGLE BETWEEN THE LEGS EXCEEDS 120 DEGREES, THE TENSION ON EACH LEG INCREASES BY FACTORS:-

120	Weight x 1
150	Weight x 1.93
170	Weight x 5.74
175	Weight x 11.4
178	Weight x 32.65
180	Weight x Infinity

USE OF LORRY MOUNTED CRANES

The driver of the vehicle must be trained and competent to operate the crane safely and correctly.

The use of a banksman is recommended at all times and in any case where the crane operator does not have a clear, unrestricted view of the load at all times.

The crane operator and banksman must be thoroughly conversant with crane signalling procedures.

Loading

When the vehicle is being loaded always ensure that the payload is within the individual axle plated weights and the Gross Vehicle Weight of the vehicle.

Where the vehicle is being loaded with packs, always ensure that the rows are kept straight and as close as the grab rails or forks will allow. All loads must be slung by a trained and competent slinger.

After positioning the load the crane should be extended and secured in place so as to achieve the minimum travelling height.

Travelling

Each driver should know the height of his vehicle when travelling.

Vehicles have differing heights for each load, so check your route before commencing the journey.

On Arrival

At the unloading site, the drop area must be carefully chosen according to the following requirements:-

- Firm level ground for the vehicle and the drop site.

- Stabilisers should not be placed over manhole covers.

- Area should be free from overhead cables and other obstructions.

- Stabilisers must be checked if on uneven or soft ground. Where necessary, sole plates must be used to spread the load on each stabiliser.

All mechanical off loading vehicles must be fitted with hazard warning flashers, which must be used during off loading.

Engaging the Power Take Off (P.T.O.)

Before engaging the P.T.O. always depress the clutch and wait a second or two before operating the P.T.O. lever.

Under no circumstances must the P.T.O. be engaged without using the clutch.

Stabiliser Legs

These must always be used when loading/unloading and pulled out to their full extent. The legs should be lowered sufficiently to stabilise the crane. Incorrect use of the legs is both dangerous and very damaging to the vehicle.

On soft or uneven ground, sole plates must be put under the stabilisers to spread the downward load.

Unloading

Before operating the crane, all the fittings must be removed and stacked in a separate area. Ensure that items to be unloaded are within the prescribed limits of the equipment being used. If necessary, split the load / pack to ensure that no overloading occurs.

When stacking packs, ensure that the stacks are placed on level ground and that they will not topple.

If it is necessary to use lifting chains, ropes straps etc. the loads to be unloaded must be slung by a trained and competent slinger.

Never leave the lorry unattended with the load suspended or the engine running or with the P.T.O. engaged.

When Slewing The Crane

Always ensure that the grab/forks are low and as near the crane column as possible.

Operation of the hydraulic controls should be carried out in a smooth manner to eliminate the possibility of the load becoming dislodged.

Onlookers must not be allowed within the working area. Under no circumstances should any person other than the banksman direct operations.

Before Leaving Site

Immediately you have finished operating the crane, disengage the P.T.O.

Raise and retract the stabilisers and lock and pin the cam locks. Moving off while the legs are down will cause serious damage.

Secure the crane and the grab/forks.

Never attempt to jack-up the wheels with the stabiliser legs, as this can put excessive stress on the crane mounting bolts which may lead to failure and the collapse of the crane.

Routine Care and Maintenance

It is necessary for the driver to carry out certain checks on a daily basis:-

- Check oil levels.

- Check for worn or damaged pipes.

- Check for oil leaks whilst operating the crane.

The equipment can only be expected to function correctly if it is kept clean and free from grit at all times.

All defects must be reported as soon as they are discovered and advice sought as to whether it is safe to continue using the equipment.

BUILDERS / PLATFORM HOISTS

Hoists are only to be operated when the following conditions are satisfied:-

No person under the age of 18 years should be permitted to be the Hoist Operator.

The Hoist Operator must be suitably trained and certificated.

Hoists must not be operated from more than one position.

Suitable and substantial gates must be provided at each landing place. The gates must be fitted with efficient interlocking devices so that the gate can only be opened when the hoist platform is at the landing place. The hoist platform must not be able to move from the landing place until the gate is closed.

The gates must be to a height of at least 2 metres at ground level and at every landing place, or otherwise designed so that persons cannot enter the hoistway.

The base of the hoistway must be enclosed by a cage.

All loads on the platform must be secured to prevent displacement.

Statutory notices must be displayed showing the SWL of the hoist platform, that no persons should ride on the hoist platform and that integral gates must be kept closed unless the platform is being loaded /unloaded.

A weekly **INSPECTION** of the hoist and its working gear must be carried out by a competent person. A report of the result of each inspection must be entered in the Lifting Appliance Register.

Hoists must be **THOROUGHLY EXAMINED** by a competent person:-

- * after being installed at a new location
- * after any exceptional circumstances that may jeopardise the safety of the equipment
- * every 12 months (6 months for hoists lifting persons)

The report of the Thorough Examination must be kept at the workplace.

SCAFFOLDS & WORKING PLATFORMS

Scaffolding must meet the requirements of the Work at Height Regulations which set out the minimum standards to be achieved.

It is our policy to adhere to the recommendations in Code of Practice BS:EN 12811-1 "Access and Working Scaffolds and Special Scaffold Structures in Steel" and the NASC Technical Guidance TG20, as this relates to the design, construction, stability, maintenance and dismantling of scaffolding.

Erection and dismantling will be in accordance with SG4:10 "Preventing falls in scaffolding and falsework"

Scaffolds are only to be erected, altered or dismantled by trained and competent persons holding recognised Construction Skills qualifications for Advanced and Basic scaffolders (CISRS). Any Trainees or Improvers will be properly supervised during their work on scaffolding activities.

The following requirements are relevant to ALL scaffolds, both fixed and mobile:

Guard-rails and toe-boards **MUST** be provided to the sides of all scaffold working platforms (including the stop-ends) from which persons are liable to fall a distance which may cause injury. The top guard rail must be at least 950mm above the edge from which a person is liable to fall and the gap between guard rails or guard rail and toe board must not exceed 470mm. This will usually require the fitting of a toe board and two guard rails.

Where materials are to be stored above the height of the toe board, brick guards must be fitted although, unless there are installed without gaps and secured in place, their use should not be considered as an alternative to an intermediate guard rail.

The desired minimum width of a scaffold working platform is 600mm, where this can be achieved.

The minimum height of a toe board is 150mm.

Scaffold standards must rest on steel base plates. In soft ground or ground of suspect stability, timber sole plates each with an area of **NOT LESS THAN 1000cm²** must be used under the base plates. e.g. 225x450mm or 325x325mm

Joints in both standards and ledgers must be staggered and must not occur in the same bays.

All scaffolds must be properly strutted and braced to provide stability. If rakers are used, they must be tied back to the framework.

All scaffolds must be tied to the structure at intervals **NOT** exceeding 16m² (every other bay). Sheeted scaffolds will require to be designed by a competent person.

Scaffold working platforms **MUST NOT** be overloaded or obstructed with materials or equipment.

Materials **MUST NOT** be thrown from scaffolds. All materials and debris must be properly lowered unless a specific area is cordoned off with a fence and warning signs are erected.

Proper access **MUST** be provided to all scaffold working platforms. If ladders are used, these must be properly secured to a platform ledger and **NOT** to a guard-rail. A stair tower is always preferred.

Loading bays must be fitted with adequate protection to all elevations. Inward opening gates should be used to protect the leading edge in preference to movable guard rails.

Sheeted scaffolds must be specifically designed so as to withstand wind loadings.

All scaffolds both fixed and mobile must be **INSPECTED** by a competent person before first use, after substantial alteration/modification & every 7 days and after any event likely to have affected its strength or stability.

All scaffolds not erected in accordance with a recognised standard and system must first be designed and have structural calculations carried out. A copy of the design and calculations must be available on site, as must a written assembly, use and dismantling plan.

Scaffold structures that must be designed include:-

- Shoring scaffolds
- Access birdcages
- Temporary roofs
- Staircases and fire escapes
- Bridge scaffolds
- Boiler scaffolds
- Steeple scaffolds
- Sealing end structures
- Masts and lighting towers
- Towers requiring guys or ground anchors
- Loading bays founded on the ground
- Offshore scaffolds outside OCA handbook
- Mobile & static towers outside base:height limitations
- Free standing scaffolds outside base:height limitations
- Any scaffold which falls outside the scope of 'Basic Scaffolds' as detailed in TG20
- System scaffolds outside the users' guide parameters
- Any scaffold structure subject to vibration, high loading, long term duration or in high risk areas
- Cantilevered scaffolds
- Facade retention
- Access scaffolds (3 or more lifts)
- Butressed free-standing scaffolds
- Slung and suspended scaffolds
- Fans, nets and pavement frames
- Lifting gantries and towers
- Advertising hoardings/banners
- Sheeted scaffolds
- Pedestrian footbridges or walkways
- Temporary ramps and elevated roadways
- Scaffolds loaded from passenger/goods hoists
- Truss-out scaffolds
- Support scaffolds
- Temporary buildings
- Spectator terraces/stands
- Marine scaffolds
- Power line crossings
- Sign board supports
- Temporary storage on site
- Transmission towers

N.B. The above list is not exhaustive and any scaffold that does not comply with manufacturers' guidelines as published in handbooks, will require a specific design produced by a competent person.

Further information about the requirements for scaffolding to have a specific design can be found at <http://www.hse.gov.uk/construction/safetytopics/scaffoldinginfo.htm>

SCAFFOLD INSPECTIONS

A report must be prepared for each inspection, unless a report has been made within the preceding seven days. The report may be made in the scaffold register, and must include the following information :-

- a. Name & address of the person on whose behalf the inspection was carried out.
- b. Location of the workplace inspected.
- c. Description of the place of work inspected (including plant, equipment & materials).
- d. Date and time of inspection.
- e. Details of matters identified that could give rise to risks to health and safety.
- f. Details of action taken as a result of matters identified in e. above.
- g. Details of further action considered necessary.
- h. Name and position of the person making the report.

Mobile tower scaffolds are subject to the inspections mentioned above, although a report is only required if the tower remains erected in the same place for seven days or more.

Obtain a hand-over certificate from scaffold erectors before bringing into use. An inspection of scaffolding must be carried out by a competent person and include the following matters:-

Ties

Unsheeted scaffolds to be tied every 40 sq. m. (32 sq. m. for movable ties)

Sheeted scaffolds to be tied every 25 sq. m.

Ties at max 8.5m both vertically and horizontally

No more than 50% removable ties (e.g. reveal ties)

Specific design for sheeted scaffolds to allow for wind forces

Bases

Steel base plates must be used

For infirm ground, use timber sole plates (1000 sq. cm.)

Standards must not rest on blocks, bricks etc.

Standards

All standards must be vertical

Tube joints must be staggered into alternate lifts

Ledgers

Ledger lines must be level

Ledger joints must be staggered into alternate bays

Transoms

Must be correct length (no excessive overhang)

Putlog transoms must be fitted with spade flat

Transom ends must be capped where necessary

Internal ends must butt against wall

Ledger Bracing

Fitted on alternate pairs of standards

Must be attached with load bearing couplers

Face Bracing

Must extend to full height of scaffold
Must be attached with load bearing couplers

Decking

Boards must be in good condition (not excessively cracked, split or warped)
Each board must be adequately supported on transoms
Overlapping boards should be avoided or have fillets fitted
Lash boards in severe weather
Toe- boards must be secured and fitted to all platforms.
Stop-end toe boards must be fitted
Platform must be correct width (e.g. 4 boards for men and materials)

Guard Rails

Top guard rail at least 950mm above the platform
No gaps of more than 470mm between guard rails or guard rail and toeboard
Toe boards must be at least 150mm high
Loading bays must be fitted with rails and toe-boards
No openings in guard rails are permitted (except for ladder access)

Ladders

No excessive cracking in stiles
All rungs in place and secure
Not painted so as to cover defects
Must extend 5 rungs past landing
Secured at top or bottom (or footed)
Secured to ledger; not guard rail at 75 degrees (1 in 4)

(Ideally set at right angle to platform and secured to extended transom)

Loading

No scaffold to be overloaded
Materials must not block walkways
Brick guards must be fitted if materials are stacked above toe board height
Lay stacks on standard/ledger joints
Guard rails and toe boards removed for loading must be immediately refitted.

Register Entry

Ensure register page is headed with site address
Enter date and time of inspection
Clearly identify which piece of scaffold the entry is for
Do not make one entry for several different scaffolds
State whether in good order or what faults are present
Sign the register for each entry
Do not use "Ditto" marks

If any doubt exists about the safety of a scaffold, stop work on the suspected assembly, erect "Not In Use" signs, remove access ladders and call scaffold erectors.

PREFABRICATED ALUMINIUM SCAFFOLDING

This guidance related to free-standing mobile access towers manufactured from prefabricated components and is based on information contained within the Prefabricated Access Supplier and Manufacturers Association (PASMA) Operator's Code of Practice.

Stability

One of the 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 will show the safe height to which the various tower configurations can be erected. Consequently, the manual must always be available at the erection site.

It is not appropriate to apply simple rules of thumb (e.g. height to the base ratio of 3x base dimensions for external use or 3.5x for internal use). Instead, reference must be made to the manufacturer's assembly instructions that will show the safe height to which various tower configurations can be erected and provide information on the use of stabilisers and outriggers to increase stability of high towers. PASMA recommends that stabilisers or outriggers are added at the first available opportunity, usually after the first module is complete.

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 and stabilisers.

Towers should be stable in a free-standing condition in a wind pressure that equates to 28mph (Beaufort force 6); however, **if the wind speed should exceed 17mph work you should cease to work upon the tower**. If the wind speed is likely to reach 25mph the tower should be tied into rigid structure and if it is likely to reach 40mph, it 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 the 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

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 be fitted with castors.

Cantilever Platforms

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

Scaffolding Boards and Staging

Deck areas on aluminium towers must not 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 the minimum of 600mm oversail on either end support. If the unit is purpose designed with integral hooks for attachments 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.

Handling & Storage

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

Inspections

Before Erection of Tower

Ensure that the manufacturer's (or 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 – check the castor housing and wheel are not damaged, that the wheel and swivels rotate freely and that the brake is effective;
2. Adjustable legs – check they are not bent, or have damaged threads, the threads are free from debris and are clean, and the device fitted to stop the leg falling out is functioning;
3. Frames – check that the members are straight and undamaged and that they are free from damaging material (such as concrete). Spigots must be straight and parallel with the axis of the column tube; all locking devices must be functioning correctly;
4. Braces, stairways and ladders – check that they are straight and undamaged and that the locking hook mechanisms are functioning correctly;
5. Platforms – see that they are undamaged and the frames true and square. Plywood decks must not be split or warped and must be fixed firmly to the frames. Where toe boards incorporate clips or fittings, these must be in good condition;

6. Ancillary parts - such as outriggers and stabilisers – check they are undamaged and function correctly.

Before Use

After the tower has been erected, the following checks must be made before it is used:

1. Is it level and square and are the horizontal braces and platforms level?
2. Are the outriggers or stabilisers correctly positioned and secure?
3. Are the base plates or castors in full contact with the ground? Are the castors properly locked?
4. Are all spigot and socket joints secure?
5. Has the bracing been fitted in accordance with the manufacturer's instructions?
6. Are all guard-rails (including intermediates) and toe boards in position?
7. Are access stairways and ladders in position and correctly secured?
8. Is the ground clear of obstructions, potholes and overhead obstructions?

During Use

During use the scaffold must be kept in good order. Should parts become damaged, they must be replaced before the scaffold is used again. Due to the nature of 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 re-inspected as described above.

A working platform 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 mobile working platforms.

Where a tower is used in a public place, precautions must be taken to prevent unauthorised access onto them, or vehicles colliding with the tower. This may be by the use of security fencing. Certain locations may require a pavement licence, which can impose additional conditions of use.

If a tower is to be left incomplete or damaged then it must display a notice warning of its condition. The sign must be clearly visible and all intended means of access removed or blocked off.

TIMBER FRAME ERECTION

The construction of timber-framed structures is becoming increasingly popular for a variety of reasons, including the cost of construction and the shorter construction time. However, the fast-moving nature of the work, together with the need to handle and manoeuvre large, heavy items, creates its own special hazards and risks, requiring careful consideration and control. There are a number of aspects which should be taken into consideration on all timber frame construction operations, including:-

- Planning
- Unloading and storage of materials
- Handling and manoeuvring
- Erection
- Fire safety

Further details of each of these considerations are given below and should be read in conjunction with other relevant sections of this safety manual (e.g. work at height, lifting operations, selection and use of PPE etc.)

Planning

Prior to commencing on site, it is essential that the work to be carried out is carefully planned so that any potential issues can be addressed early.

A pre-start meeting must be arranged between the erector, the principal contractor and/or the Principal Designer, at which the following subjects will need to be discussed, in addition to the usual agenda:-

Delivery Vehicles

Vehicles delivering timber wall and roof panels will, of necessity, be large (usually articulated flat-bed lorries) and therefore will require sufficient room to allow for safe manoeuvring and unloading. All unloading will be mechanical, so enough space for crane and/or fork lift truck movements must also be provided. Where it is reasonably practicable, the need for lorries to reverse should be avoided.

Means of Unloading (Lifting Appliances)

The weights (and shapes) of loads should be established prior to delivery to site and provided to the person or company responsible for the unloading, so as to ensure that the correct lifting appliances are available on site (issues such as SWL, means of attaching load, centre of gravity etc. should all be taken into consideration).

The need for persons to climb on to the trailer should be avoided where possible; this can be achieved by careful and considerate loading of the lorry at the factory. Lifting eyes or straps can be used in such a manner as to allow for remote attachment of lifting gear when on site. However, if it becomes necessary for a person or persons to access the trailer, then the Work at Height Regulations will fully apply and sufficient precautions will be necessary (e.g. use of bean bags or overhead gantry and harness).

Storage Areas

The principal contractor should provide a suitable storage area close to the final erection area, so as to minimise the number of lifts and the distance over which components must be moved (see below).

The Work Area

To allow for safe erection, the work area must be easily accessible, usually with a firm, level area around the perimeter of the slab, to allow for the erection of scaffolding and the movement of men and materials around the building.

A pre-start inspection of the work area must be carried out to check on matters such as ground conditions, access, overhead obstructions or cables etc.

Unloading and Storage of Materials

In addition to the general matters mentioned above, the following should be taken into consideration:-

- i). As a general rule, components for timber frame buildings should be lifted and moved on the minimum number of occasions so as to minimise risks. The preferred method is to unload the components and place them directly at the site of their intended use.
- ii). If there is any doubt about the manner in which components should be supported or lifted, prior advice should be sought from the manufacturer.
- iii). Where appropriate, strongbacks or lifting beams should be used to prevent distortion of components being caused by incorrect lifting.
- iv). When unloading using fork lift trucks, care must be taken to ensure that the positioning of the forks does not result in the panels or other components become overstressed or buckled.
- v). At all times, beams and bundles of beams should be kept vertical when being moved. The manufacturer's instructions should be followed when moving and storing wall panels and floor cassettes.
- vi). The storage area should be level, well drained and free of vegetation. The ground should be firm and level and there must be sufficient room to allow for safe manoeuvring of fork lift trucks etc.
- vii). Consideration should be given to the moisture content of timber products. Where weatherproof protection is necessary it should provide ventilated air to the products.
- viii). When storing materials vertically, props must be installed on both sides so as to ensure materials cannot fall.

Handling and Manoeuvring

Given the scale and complexity of lifting operations that will be required for timber frame construction, a competent and skilled Appointed Person for Lifting must be designated to plan and manage the lifts. On complex sites, where more than one crane may be operating, a Lifting Co-Ordinator must be appointed.

The "Lifting Operations" section of this manual gives more detailed guidance on planning and undertaking lifting operations, together with additional information about slinging of loads. However, there are a few specific considerations which should be made when lifting timber frame components:-

- i). If units are placed onto temporary working platforms or storage areas, it must first be confirmed that they are of sufficient strength and stability to support the load safely

- ii). Where temporary storage or work platforms have been created above ground level, then the Work at Height Regulations will apply in full. Proper protection against falls of men and materials must be provided, preferably by the use of guard rails and toe boards.
- iii). No persons must be permitted to enter areas underneath operating cranes or those areas required for slewing.
- iv). If bundles are being transported (ie. for joists/trusses) then they must be secured and slung by a fully trained and competent slinger/signaller who has experience of the task in hand.

Erection

Every timber frame erection operation will be different, for a number of reasons, such as size of structure, component parts, access etc. Even where identical structures are being erected on the same site, differences will occur.

For the reasons given above, a separate and specific method statement should be drawn up for each job. Guidelines for the preparation of method statements are contained elsewhere in this manual and they can be consulted for reference.

In addition to the method statement detailing the management arrangements, an erection sequence will be essential to ensure that the building is constructed in the safest manner. The basic sequence will usually be provided by the manufacturer or erector, but must always be checked on site to ensure that no modifications are necessary.

Of particular concern when erecting timber framed structures is the danger to operatives created when installing above-ground floors, whether they are constructed on site or by way of cassette installations. Both methods present a significant risk of falls from height and careful control measures must therefore be implemented. A combination of controls can be used, such as the use of temporary edge protection, together with the careful placement of soft landing systems (bean bags or air bags).

In addition to the method statement, on complex and busy sites it is often beneficial to adopt a Permit To Work system (PTW). A PTW can increase the level of the control over hazardous activities by clearly stipulating requirements about such things as the persons permitted to work at height, working times, times to be used for lifting operations etc.

Fire Safety

Obviously, the use of large amounts of timber products on construction sites presents significant fire safety issues. It is therefore essential that the fire risk assessment for the site deals with the special risks connected with timber frame erection.

As the construction proceeds the fire safety arrangements will need to be updated to allow for the change in conditions.

SAFE USE OF LADDERS

Ladders must only be used for access or as a workplatform after the site manager has assessed the operation and determined that no suitable alternative is available. Where their use is necessary, it will only be permitted if three points of contact can be maintained (ie. at least one hand must be holding the ladder at all times).

All ladders in use **MUST BE SECURED** so as to prevent slipping:-

- a). At the top on both stiles- or if this is impracticable:-
- b). At or near the base on both stiles - or if this is impracticable:-
- c). Using recognised anti-slip devices, or:-
- c). A person must foot the ladder (standing on the bottom rung).

All access ladders must extend at least 5 rungs (1.10M) above a landing place or an alternative hand-hold provided for a user when ascending or descending.

The safe angle at which a ladder should be used is 75 degrees or 1 out and 4 up.

Timber ladders must not be painted so as to obscure defects.

Landing places should be provided at not more than 9m intervals when using a series of vertical ladders.

Where ladders pass through openings, these must be kept as small as is reasonably practicable.

Only one person should use a ladder at a time.

All ladders must be frequently inspected for damage, paying particular attention to splits or cracks, excessive warping and missing or defective rungs.

Written records of these inspections must be kept and accompany the equipment to every place of use.

Ladders used as a part of a scaffold must be inspected together with the scaffold and a report of the condition, entered in the Scaffold Register.

THESE RULES APPLY EQUALLY TO SCAFFOLDERS DURING ERECTION AND DISMANTLING OPERATIONS, AS THEY DO TO THE USER OF A COMPLETED SCAFFOLD.

GIN WHEELS

Wheels must be secured to a horizontal tube which must have two fixings or anchor points, using load-bearing couplers. Tripod supports must have counterweights secured which are three times greater than the load being lifted.

Only safety hooks ("C" type - or those with safety catches) are to be used. Bent reinforcing rod is NOT to be used as a hook. All hooks are to be tested and certificated.

The hoist rope must be in good condition and not frayed or knotted.

No gin wheel is to be over-loaded. The maximum SWL should not exceed 50kg.

All gin wheels and gear is to be INSPECTED weekly by a competent person and a report of the result of each inspection is to be entered in the Lifting Appliance Register. A Thorough Examination will be required each time the equipment is erected in accordance with The Lifting Operations and Lifting Equipment Regulations. A copy of the inspection records must accompany the Gin Wheel to every place of use.

ROOFWORK

Roofwork is a high risk work activity. Almost one in five construction deaths are caused by falls from or through roofs. Falls through fragile materials (roof lights and asbestos cement sheeting) account for more of these deaths than any other single cause.

The Hazards:-

- * Roofwork is considered to be a "High Risk" activity, regardless of the complexity of the work.
- * Persons engaged in Roofwork are at considerable risk of falling through openings and fragile materials.
- * Falling materials - workers on site and members of the public can be at risk from materials falling.
- * Access/egress to and from roofs can be more of a risk than the actual work being carried out.
- * Adverse weather conditions can seriously affect the safety of roof workers.
- * Overhead electricity cables can cause danger from contact or near contact with materials such as ladders, scaffolding and metal roof sheets.

Types of work:-

- * Inspection of roofs prior to the commencement of work (sometimes by untrained or unaware persons).
- * Maintenance and repair - often short term work with little attention paid to the risks.
- * Refurbishment - can involve persons working on existing fragile roofs or roofs in poor condition.
- * Major work - roofing and re-roofing of domestic and industrial buildings.
- * Demolition - stripping of reusable materials such as slates.

Safe system of work:-

A safe system of work must be provided for all Roofwork. The carrying out of a formal Risk Assessment and the provision of a safe system of work is essential to ensure safety.

Method Statements must identify working positions, access to the roof and on the roof and include the following:-

- * what hazards are present
- * how falls are to be prevented.
- * how danger can be prevented to persons working below and members of the public.
- * how other risks, identified at planning and survey stages are to be controlled.
- * what equipment will be needed (and how equipment/materials will be safely transported to and from the roof)
- * who will carry out the work, competence of persons, sub-contractors etc. (will additional training be required ?)
- * how changes in work will be dealt with without prejudicing safe working.
- * who will supervise the work and who will monitor the effectiveness of the safe system of work.

Edges **MUST** be provided with means so as to prevent the falls of persons and materials by the use of guard-rails and toe-boards, or if this is impracticable by a double guard-rail system, if the toe-boards are omitted for the purposes of the work.

If it is impracticable to erect a guard-rail system at floor edges, a physical barrier must be erected at least 2 metres from the edge, i.e. scaffold tubes or other physical restraints.

Plastic bunting with warning signs may be erected in areas remote from roof edges (stairways, doorways, etc.), to advise persons of NO-GO areas.

Do NOT pass across or work on or near fragile materials, e.g. FILON or similar roof sheets, asbestos cement sheets, wood wool slabs, roof-lights, etc., unless stagings or crawling boards are provided and are fixed over the material. It is also necessary to erect signs warning of the fragile nature of the materials.

On new work, roof-lights must be 'man-safe' (this should be a design feature).

The carrying of decking materials during strong winds should be avoided because of the risk of being blown off balance. The HSE have published recommendations for maximum wind speeds for slating and tiling and these should be adhered to at all times. They are as follows:-

All laying or handling of slates, tiles, battens and felt at roof level:

Cease activity when mean wind speed reaches 23 mph (gusting to 35 mph or over)

Handling rolls of felt at roof level (extreme care should be taken)

Cease activity when mean wind speeds are in the region of 17 mph (gusting to 26 mph or over)

Do NOT walk on narrow roof ledges or parapets. Always look behind before stepping backwards.

If valley gutters are used for access or as the place of work then guard rails must be erected on the open side(s). Care must be taken to ensure that those who erect edge protection have a safe access and a safe place of work. The use of safety harnesses, attached to suitable anchorage points, must be considered.

Where staging boards are used as a working platform to facilitate the laying of sheets, the platform must be at least 600mm (two boards) wide. The boards must be fixed together to prevent the creation of openings in the working platform.

Where it is not practicable to maintain guardrails on stagings, the erection of safety nets or the provision of a birdcage scaffold should be considered.

Stacking materials on a roof before work begins causes access problems and should be avoided. If this is not practicable, consideration must be given to the safety of persons during stacking operations and access to the stacks by roofers by using one of the following methods :-

- Working platforms fitted with toe boards and guard rails.
- Mobile access equipment.
- Safety nets.
- Safety harnesses

It is not acceptable for open steelwork to be used as the access/place of work without further precautions against a fall.

Where it is not practicable to provide working platforms, guard rails, safety nets, barriers etc., personal suspension equipment such as boatswain's chairs must be provided and used. These may only be used by trained, competent and supervised persons.

All personal suspension equipment is subject to the same requirements for inspection and reporting of the results of inspections as working platforms.

Where it is not practicable to comply with above, fall arrest devices and safety harnesses must be used.

NOTE: IT IS RECOMMENDED THAT THE CONTENT OF HS(G) 33 "HEALTH AND SAFETY IN ROOFWORK" IS CONSIDERED PRIOR TO ANY WORK ON OR NEAR ROOFS. (AVAILABLE FROM HMSO)

SAFETY NETS AND HARNESSSES

Safety Nets

Regulations require the use of safety nets where it is not practicable to provide standard working platform or gangways, suitably protected with guardrails and toe boards.

Safety nets are to be erected as close to the working level as possible and, if on the outside of the structure, should be higher at the outer edge than at the inner edge or centre.

Types and Strength

There are two types of safety nets:

1. Personnel nets, designed to catch personnel falling from working places;
2. Material or protection nets, designed to protect persons below from falling objects.

Personnel nets are usually constructed of 100mm mesh. The thickness of the cord is determined by the distance below the working level at which they are erected. Every effort must be made to keep this distance to a minimum. In any event, the manufacturer's instructions must be adhered to, in order that design loadings are not exceeded in the event of a person falling from the working platform or place.

Manufacturers should be consulted as to the suitability of their net, should there be any doubt.

Material or protection nets are constructed of a much smaller mesh and combination, the mesh usually being of 20mm and the cord with a breaking strain of approximately 22kg.

Nets can be manufactured of either man-made or natural fibre. Manufacturers are to be consulted about the suitability of different fibres for different environments and uses.

When using nets, consideration must always be given to the strength of the structure to which it is attached. This may be particularly important when using brackets to attach the net to a newly constructed wall.

Storage

Stored nets must be protected from damp and heat. It is good practice to hang them on wooden pegs or galvanised hooks so that air may circulate through them.

We nets should be allowed to dry naturally.

If nets need to be stored on the floor they must be stacked on pallets or baulks of timber and kept clear of the ground.

Always ensure nets are stored in accordance with the manufacturer's recommendations.

Safety Harnesses and Belts

Safety Harnesses - are designed to limit the distance of any fall and thereby minimise the risk of injury. They are also used to facilitate the safe rescue of persons working in confined spaces, such as manholes, etc.

Safety Belts - are not suitable for arresting a fall, but only as a restraint to prevent access to a danger area.

Safety belts and harnesses provide valuable protection, but they should never be considered as the primary fall prevention measures. **It should be clearly understood that, where practicable, proper working platforms, with guardrails and toe boards, must be provided.** Where the provision of working platforms, or the use of safety nets, is impracticable, safety harnesses or belts must be provided and used. Instruction and training must be given in the proper fitting, adjustments and use of harnesses and belts.

Type of Harnesses and Belts

These comprise straps, fittings and buckles, etc., suitably arranged to support the whole body of a person or to restrain the wearer during a fall or after the arrest of a fall. Full details are specified in BS EN 361. The harness should be fitted with a lanyard that will limit the fall to a maximum of 2m. All lanyards must be fitted with a suitable means of absorbing energy, to further minimise risk of injury during a fall arrest.

Safety Belts and Chest Harnesses

General-purpose belts and chest harnesses are used in situations where short duration work is necessary in areas where the provision of fall prevention measures would be impractical. Belts and harnesses must be fitted with a line of the appropriate length to prevent access to the danger area (e.g. void or edge).

Pole Belts

Pole Belts comprise an adjustable body belt, combined with a pole strap that may be integral, or detachable by means of a suitable snap hooks and rings. The user should be able to alter the length of the pole strap without uncoiling it, permitting movement within 600mm of the anchorage. Details are specified in BS EN 358.

Use of Belts and Harnesses

Whenever a safety belt or harness is provided, there must also be an effective means of fixing it to a suitable anchorage at all times the protection is required. It is essential that the fixing point for a harness is strong enough to withstand the snatch-load of a fall.

The use of two lanyards will sometimes be necessary to ensure constant attachment whilst moving.

The distance of fall should be as small as is reasonably practicable and should not exceed the dimensions specified above. The harness lanyard should be fixed to the structure or fixing point above the working position.

Care must be taken to ensure that safety harnesses and lanyards are not damaged during use. Fastening the lanyard around small-sectioned structural steel or other sharp objects, and hooking the carabiniere back on to the lanyard, may cause failure. As an alternative, it is recommended that a tested loop of at least 8mm diameter steel wire rope, with properly made eyes, be used. The wire loop should be wrapped around the steel and the harness or belt attached to the loop, ensuring that the maximum permitted falling distance is never exceeded.

As an alternative, anchorage may be provided by use of a proprietary hooks, available with openings to accommodate metal sections of up to 50mm.

Fall Arrest Devices

Fall arrest devices are designed to allow greater freedom of movement. They have two main features:-

1. They extend the area over which the user may work safely.
2. In the event of a fall, they restrict the drop, thereby reducing the load imposed upon the body on sudden arrest.

There are two main types of fall arrest devices - velocity sensing, or automatic.

Guided Type Fall Arresters

These consist of a flexible or rigid anchorage line, a self-locking guide-type fall arrester attached to the anchorage line and a lanyard which is attached to the fall arrester.

The safety harness is attached to a self-reeling cable. The reeled cable is contained within a block, in which is contained an arrester device. The arrester device is secured to a suitable anchorage point and the self reeling cable is fastened to the safety harness; the wearer is then free to move to any position permitted by the self reeling cable. If the cable is pulled rapidly away from the block, the locking device in the block is brought into operation, thereby preventing the fall developing.

Use of Fall Arrest Devices

The following precautions must be observed when using a fall arrest devices:-

1. The correct type of rail or cable for the device must be used for the anchorage line.
2. The attachment point and attachment structures must be adequate to hold the user in the event of a fall.
3. Before each use, devices should be tested on the anchorage line by simply lifting the device and letting go – if it does not lock at once, it must be immediately withdrawn from service for inspection, overhaul and rectification. For velocity sensing devices e.g. Sala Blocks, the end of the anchorage line should be jerked to simulate a fall; this should lock the device. Should the device not lock it must be immediately withdrawn from service for investigation.
4. Instructions for the safe use of the equipment, which must be provided by the manufacturer, must be communicated to all users.
5. Regular inspections and maintenance of the equipment must be carried out, in accordance with the manufacturer's instructions. Records of all maintenance and inspections must be kept.
6. Equipment must be stored safely in accordance with the manufacturer's instructions.
7. Should the device be subjected to shock loading, action must be taken in accordance with the manufacturer's instructions. Usually, the device must be immediately taken out of service and returned to the manufacturer for inspection and overhaul.

Energy Absorbers

Energy absorbers are installed between the harness and the anchorage point, allowing the fall to be slowed down, thus reducing the final loading on the body.

Harness and Lanyard Inspections

Lanyards must be examined at least 12 monthly (or according to the manufacturer's instructions) and be subject to periodic inspections and checks. For each harness the following information should be available:-

1. Serial and other identification numbers - Serial numbers should be recorded in a register and should be marked on the lanyard in a suitable place, not in marker ink on a load bearing strap. There must be an area where the number and the date of the last/next inspection can be placed.
2. Frequency of inspection - usually dependent on use and environment (Chemicals, heat, friction, acids/alkalis, grit blasting etc).
3. Type of inspections carried out: pre-use checks, detailed inspection or interim inspections.

Pre-Use Check

A pre-use check should consist of a thorough visual inspection of the entire equipment and all fittings, undertaken in good light. The check would usually take between 3 and 5 minutes.

A tactile inspection of the webbing and stitching should be carried out. This is done by running it slowly through the hands to identify any broken, softened or hardened fibres that would be indicative of chemical attack or structural weakening.

Detailed Inspections

All equipment must be subjected to a detailed inspection at least every six months but also as laid down by any other requirements, usually dependent on use (e.g. three-monthly for steel erection, demolition, scaffolding, steel skeletal masts or towers with edge protrusions). The manufacturer will specify precisely what the detailed inspection must entail.

The inspection must be carried out by a competent person and the results recorded in a register, kept with the equipment for reference as necessary.

Interim Inspections

An additional detailed inspection may be necessary where the findings of a risk assessment identifies risks that could result in significant deterioration. The results of the inspections must be recorded.

Other Important Considerations

1. The person who carries out inspections of harness equipment must be properly trained, competent and authorised to carry out the work.
2. Users of harnesses and belts must be properly trained in their use, care and storage.
3. The manufacturer's instructions must be readily available for reference.

Lanyards

A lanyard should be withdrawn from use and passed to a competent person for detailed inspection if:-

1. There is no evidence that the lanyard has been inspected in the last 6 months by a competent person.
2. The lanyard is not identifiable.
3. It is marked with a British Standard rather than a European Standard (and CE marked).
4. After a pre-use check or interim inspection, a lanyard is thought to be defective.

5. If there is any doubt about its safety.

Defects

Examples of defects that can cause degradation and/or weakening of the lanyard or harness include:-

1. A knot in the lanyard, other than those intended by the manufacture;
2. Surface abrasion across the face of the webbing and the webbing loops, particularly if localised;
3. Abrasions on edges, particularly if localised;
4. Cuts in webbing rope or stitching;
5. Chemical contamination (colour changes in webbing, hardening or softening of fibres);
6. Heat or friction damage (a glazed appearance of the webbing);
7. Damaged or deformed fittings;
8. UV Degradation (powdery surface and possible change of colour fading, hard to detect or determine);
9. Partial deployment of an energy absorber;
10. Contamination with grit, sand, silt etc.

HARNESSES – RESCUE PROCEDURES

The planning process leading to the undertaking of any work at height using fall arrest equipment must include the formulation of effective rescue procedures should an arrested fall occur.

Suspension Trauma

Suspension trauma can result if someone is left suspended in a harness for too long. Following a fall, if the person is upright and motionless (e.g. unconscious), this can lead to the blood becoming pooled in the limbs (venous pooling) starving blood to the brain. This can develop quickly and have potentially fatal consequences.

Rescue, especially of any unconscious person, would need to be initiated rapidly (for example within 15 minutes) to reduce the risk of suspension trauma. This is before any individual medical factors or fitness issues are taken into account.

An injured person hanging in a harness awaiting rescue might be better off in a substantially horizontal position or with the knees elevated. During rescue, it could be advisable not to allow the casualty to become totally horizontal, but to be in a sat-up position with the knees bent, to avoid a rapid return of venous blood to the heart. The eventual movement of the casualty to the horizontal position should perhaps be carried out only very slowly over an extended period of around 30 min to 40 min. It could be necessary to consider dialysis to protect the kidneys. Medical advice should be sought on these points.

(Further information is available in the HSE Contract Research Report 451/2002 Harness suspension: Review and evaluation of existing information).

Rescue Procedures Following An Arrested Fall

All workers using fall arrest equipment should be trained in the procedures to follow in the event of an emergency caused by a fall.

If rescue equipment needs to be available, it must be located near to the area of works. If equipment is provided by others, e.g. the principal contractor, checks must be made **prior to the start of any works** that the equipment is available and not locked away or located on another part of site.

Relying on the fire brigade / emergency services may not be sufficient, as the injured party could sustain life-threatening injuries in the time it would take for emergency services to attend site. They should only be relied upon to give treatment once someone had been rescued.

Any person using rescue equipment must be competent in its use – i.e. has had the relevant information, instruction and training.

Rope rescue equipment must be suitably anchored prior to use.

Where a person suffers an arrested fall and is unable to recover himself, the alarm must be raised and procedures for effecting a rescue immediately set in motion. Several options are available. The option selected would depend upon actual site conditions and could include the following:-

- a. The suspended person could be drawn into the building or onto a working platform by rescuers, removed from the harness and taken to ground level.

- b. If a retrievable type inertia reel system is used with fall arrest equipment, the suspended person could be winched up to a position from which he could be drawn into the building or on to a working platform by rescuers, removed from the harness and taken to ground level.
- c. A remote rescue kit could be used, enabling rescuers to attach a rope positioning system to the suspended person's harness allowing the casualty to either be raised or lowered to safety.
- d. A rescuer could be raised to the position of the suspended person on a mobile elevating work platform fitted with suitable guardrails. It must be ensured that the rescuer is wearing a harness.
- e. A rescuer could be raised to the position of the suspended person using a crane fitted with a passenger carrier. It must be ensured that the rescuer is wearing a harness, that he is trained in correct signalling procedures and that he remains in constant view of the crane operator at all times during the rescue operation.
- f. A rescuer could abseil down to the position of the suspended person, attach himself to the suspended person, release the casualty's fall arrest device and either raise or lower himself to safety.

MOBILE ELEVATED WORK PLATFORMS

Because of the inherent risks in the use of these platforms from overturning, collisions by/with other plant and vehicles, contact with overhead cables and other obstructions, falls of persons and materials and the trapping of persons against parts of the structure. A full risk assessment must be carried out and the following precautions must be taken:-

- 1 The platforms are to be operated only by persons over the age of 18 years and who are in possession of a current, valid training certificate or card from a recognized training body, such as I.P.A.F. The operative must be trained for the specific classification of MEWP to be used.
- 2 Any fencing skirts required must be in position so as to prevent a trapping hazard.
- 3 The surface on which the mobile platform is used must be suitable and reasonably level.
- 4 Hazard warning cones and signs must be positioned at the approach to the platform.
- 5 Before use all overhead cables must be shrouded or otherwise protected so as to avoid contact.
- 6 All other obstructions must be avoided.
- 7 Materials must not be allowed to accumulate on the platform.
- 8 If operated by an internal combustion engine, good ventilation is necessary so as to avoid breathing in toxic fumes.
- 9 The platform must not be overloaded with operatives / materials. Ensure that the SWL is strictly observed.
- 10 It is not permissible to place scaffold boards or other materials on the top guard-rail, to increase the working height of the platform.
- 11 All defects must be reported to a supervisor for remedial action to be taken, to effect a repair.
- 12 Before using the MEWP outdoors, the operator must ensure that the machine is suitable for outdoor use.
- 13 Always check the maximum permitted wind loading of equipment being used outdoors and ensure that conditions are suitable for its use
- 14 Further information can be found in the HSE General Information Sheet No. 6 (<http://www.hse.gov.uk/pubns/geis6.pdf>). It is recommended that all MEWP operators are provided with a copy of the information sheet, and a record kept of its issue.

BATTERY CHARGING

Charging of batteries, even those which are described as maintenance free, gives off hydrogen gas, an easily ignited and explosive gas. Explosion usually occurs when connecting or disconnecting cables; vehicle terminals, charger cables, jump leads and discharge testers are the usual items which cause sparking, although hand tools (spanners etc.) and jewellery may also contribute to sparking.

Always wear eye protection when working on batteries.

Wherever possible, work in a well ventilated area.

Remove any metallic items from hands, wrists and neck before commencing work.

Always ensure that the battery is being used in accordance with the manufacturer's instructions.

Use insulated tools.

Do not smoke or use naked flames around batteries.

All cables, terminals, crocodile clips etc. must be clean and free from damage before use.

To disconnect and reconnect batteries:

- a). Turn off the ignition switch and all other switches or otherwise isolate the battery from the circuit.
- b). Always disconnect the earthed terminal first and reconnect it last.
- c). Do not rest tools or other metallic objects on top of the battery.

Whilst charging:

- a). Always observe the manufacturers instructions for charging.
- b). Charging should take place in a well ventilated area.
- c). Make sure the battery is topped up to the correct level.
- d). Ensure that the charger is switched off before connecting the charging leads. The leads must be connected like to like.
- e). Ensure that the charging leads are firmly and securely clamped in position before switching on the charger. Do not move the clamps while the charger is switched on but switch off first if adjustment to the clamps becomes necessary.
- f). Vent plugs may need to be adjusted before charging - check the manufacturer's instructions.
- g). Do not exceed the recommended rate of charging.
- h). When charging is complete, switch off the charger before disconnecting the charger leads.

When jump starting vehicles, the following procedures must be followed:

- a). Always ensure that both batteries have the same voltage rating.
- b). Check the earth polarity of both vehicles.
- c). Ensure that the vehicles are not touching.
- d). Turn off the ignition of both vehicles.
- e). Only use purpose made, colour coded jump leads.

Connection for vehicles with same earth polarity

- a). Connect non-earthed terminal of the good battery to the non-earthed terminal of the flat battery.
- b). Connect the second lead to the earthed terminal of the good battery.
- c). Connect the other end of the second lead to a suitable, substantial, unpainted point on the chassis or engine of the other vehicle, away from the battery, carburettor, fuel lines or brake pipes.

Connection for vehicles with different earth polarity

- a). Connect the earthed terminal of the good battery to the non-earthed terminal of the flat battery.
- b). Connect the second lead to the non-earthed terminal of the good battery.
- c). Connect the other end of the second lead to a suitable, substantial, unpainted point on the chassis or engine of the other vehicle, away from the battery, carburettor, fuel lines or brake pipes.

Starting

- a). Ensure that the leads are well clear of moving parts.
- b). Start the engine of the 'good' vehicle and run for one minute.
- c). Start the engine of the 'dead' vehicle and run for one minute.

Disconnection

- a). Stop the engine of the good vehicle.
- b). Disconnect the leads in reverse order to which they were connected.
- c). Do not allow the exposed metal parts of the jump leads to touch each other or the vehicle bodies.
- d). If in any doubt, seek clarification from your supervisor before attempting any operations with batteries.

JOINERY WORK-SHOPS

NO person is permitted to operate a woodworking machine unless properly trained and authorised to use a particular machine.

NO person under the age of 18 years is permitted to use a woodworking machine unless under training and under the immediate supervision of a woodworker or other competent person.

On circular saws, the diameter of the smallest blade to be used on each machine **MUST** be clearly marked.

Push-sticks must always be used when operating bench mounted circular saws.

NO guards must be removed and the riving knife on each circular saw must **NOT** be more than 12mm from the teeth of the saw blade.

If a taker-off is assisting, the bench beyond the blade must be extended in length for a distance of at least 1200mm.

A build-up of sawdust, off-cuts, etc., should **NOT** be permitted and the floor area must be kept clean.

The extract ventilation system **MUST BE THOROUGHLY EXAMINED** by a competent person within every 14 months. A report of the results of the examinations must be recorded in a Register and be made available for inspection.

The noise level in Woodworking Machine Shops generally exceeds 90 dB(A) and it is essential that operatives use hearing protection.

Hardwood dusts are known to be carcinogenic and if such wood is to be worked upon, suitable dust masks **MUST** be used.

FIRE PREVENTION ON CONSTRUCTION SITES

Every year there are numerous fires on construction sites and in buildings undergoing refurbishment. All have serious consequences - people are injured (sometimes fatally), buildings are destroyed, plant and equipment is damaged, work is held up and completion dates are not met.

Certain insurance companies have now intimated that, due to the large number of fire related claims being submitted, premiums may well rise by 4-500%.

Under the current legislation, a written fire Risk Assessment must be carried out.

The Code

The Loss Prevention Council (LPC) has published the "Code of Practice for the Construction of Buildings", (ISBN 0 902167 00 6). This sets fire protection levels for building construction, to meet insurers standards, and details an effective management strategy to ensure that its objectives are met. This strategy is divided into four main areas:- Fire Protection; The Design Fire Safety Coordinator; The Site Fire Safety Coordinator; The Site Fire Safety Plan. There are additional measures required for larger sites.

Fire Protection

An assessment of the fire risk must be made at the design phase of the contract by the employer. Particular reference must be made to achieve the early installation and operation of:-

- a). Permanent fire escape stairs, including compartment walls.
- b). Fire compartments within the buildings under construction, including fire doors and the completion of fire stopping. Special attention must be given to lift shafts, ducts and voids.
- c). Fire protective materials to structural steelwork.
- d). Planned fire fighting shafts.
- e). Lightning conductors.
- f). Automatic fire detection systems (where planned).
- g). Automatic sprinkler and other fixed fire fighting installations (where planned).
- h). Adequate water supplies for fire fighting must be available.
- i). All hydrants to be clearly marked and free from obstruction.

The Design Fire Safety Coordinator

A Design Site Safety Coordinator must be appointed and given the following responsibilities:-

- a). To ensure that the fire risk is properly assessed.
- b). To ensure that the fire risk is kept to a minimum.
- c). To liaise with the Site Fire Safety Coordinator to ensure that a Site Fire Safety Plan is drawn up and remains adequate during the construction phase.
- d). Ensure that the finished building will comply with all fire safety statutory requirements.

The Site Fire Safety Coordinator

Before the construction phase commences, a Site Fire Safety Coordinator must be appointed by the principal contractor and given the following responsibilities:-

- a). To liaise with the Design Site Safety Coordinator to ensure that a Site Fire Safety Plan is drawn up and remains adequate during the construction phase.
- b). To ensure that all aspects of the Site Fire Safety Plan are understood and complied with by all site personnel.
- c). Where required, to ensure that a Hot Work Permit System is used.

- d). To carry out weekly inspections of escape routes, fire brigade access, fire fighting facilities and to monitor the Safety Plan requirements.
- e). To carry out weekly checks of fire fighting equipment and test all alarm and detection devices.
- f). Where necessary, to liaise with the local fire brigade.
- g). To liaise with site security to ensure that the emergency procedures are clearly understood and followed.
- h). To maintain a written record of all checks, inspections, tests and fire drills.
- i). To regularly monitor the arrangements for calling the fire brigade.
- j). To promote a 'Fire Safe Working Environment'.
- k). During an alarm, to safely arrange the evacuation of the site and insure all persons report to prearranged assembly points.

The Site Fire Safety Plan

The Site Fire Safety Plan must detail:-

- a). The organisation of and responsibilities for fire safety.
- b). General site precautions, fire detection and warning alarms.
- c). The Hot Work Permit system.
- d). The location, construction and maintenance of site accommodation.
- e). Fire escapes and communications.
- f). Fire brigade access.
- g). Fire drills and training
- h). Measures to minimise the risk of arson.
- i). A materials storage and waste control regime.

On the following page is an example of a site fire safety plan for a typical construction site :-

EXAMPLE FIRE SAFETY PLAN

FIRE SAFETY PLAN

'NAME OF SITE'

1. Preamble

- 1.1 This Plan will form part of the Construction Phase Health and Safety Plan.
- 1.2 Copies of this Plan will be displayed in prominent positions on site and in site accommodation/notice boards. Diagrams and signs will also be displayed as necessary.

2. Organisation and responsibilities

- 2.1 The Fire Safety Co-ordinator is Mr, Site Manager.
- 2.2 Fire Marshals with responsibilities for individual areas will be appointed as required and will report to MrThe names of the Fire Marshals will be displayed on each floor (due to the high turnover of contractors/responsible persons in each area, names are likely to change frequently).
- 2.3 Mr will be responsible for the appointment and training of Fire Marshals.

3. Risk Assessment

- 3.1 An assessment of the risk of fire is attached.
- 3.2 Control measures are detailed within this document.

4. Fire detection equipment

- 4.1 Permanent fire detection equipment will be installed as soon as the construction programme permits.
- 4.2 Battery operated smoke detectors will be installed on each floor as appropriate, bearing in mind that operations which create large amounts of dust can be responsible for false activation of detectors.

5. Fire fighting equipment

- 5.1 The following fire fighting equipment will be available:-
 - i). Water filled fire extinguishers - at least No. located at each floor level plus 4 No. in site offices.
 - ii). CO2 Extinguishers - 3 No. located at each floor.
 - iii). Foam extinguisher - site offices.
- 5.2 Water Extinguishers to be positioned on the floor near the hand operated fire alarms.
- 5.3 CO2 Extinguisher to be positioned on the floor near the hand operated fire alarms.
- 5.4 All extinguishers are less than 12 months old.

5.5 Extinguishers to be inspected (location and condition) weekly by Site Foremen.
Written copies of these inspections will be kept in the site office.

5.6 Extinguishers to be replaced if discharged.

6. Fire escape routes / Assembly Point

6.1 Site: Front elevation - fire escape via existing routes as marked by temporary and permanent signs.

Rear elevation - existing fire escape stairs to be maintained and kept clear of debris/materials.

6.2 All perimeter fencing will be erected in such a way that its removal can be easily achieved in the event of an emergency.

6.3 Fire Marshall appointed for each floor to direct persons to safest route.

6.4 The main Fire Assembly Point is:

Car Park adjacent to Central Railway Station.

6.5 Fortnightly fire drills will take place. The results will be logged and stored in the site office.

7. Attendance by Fire Service

7.1 South Wales Fire Service have been consulted and the following attendance has been agreed in the event of a 999 call:-

2 No. Fire tenders.

1 No. Fire rescue unit

7.2 The Fire Service will approach site via Road.

7.3 Road closures/diversion will be arranged with South Wales Police by the Fire Service.

8. Highly Flammable Liquids and Liquid Petroleum Gases (HFLs & LPGs)

8.1 A minimum quantity of HFLs and LPGs will be stored in the site compound.

8.2 HFLs consist of petrol and solvents to a maximum quantity of 5 litres (each) which will be stored in a lockable vented cupboard within a storage container (ground floor). HFL/LPG and No Smoking signs to be displayed.

8.3 HFLs and LPGs will be used in areas good ventilation only.

9. Hot Work Permit

9.1 A Hot Work Permit system is in operation on this site.

9.2 A copy of the Permit is attached.

9.3 The issue of the Permit will be strictly controlled by site management.

9.4 The following will be considered :-

- a). The fire risk is kept to a minimum. Consideration will be given to the selection of plant and equipment, and work methods.
- b). Where necessary, the local fire brigade may be consulted to discuss any specific potential problems that may arise as a result of the works.
- c). Fire routes will be identified and all operatives will be informed of the procedures and assembly points (where applicable).
- d). Should work methods require the use of sources of ignition, i.e., naked flame, a Fire Extinguisher will be provided. Where considered necessary, a person may be appointed as a 'Fire Watcher'.
- e). Hot works will cease at least one hour before the end of the working day.

Additional Requirements for Larger Sites

The Site Fire Safety Coordinator must appoint a fire marshal(s) and deputy to assist in the implementation of the Site Fire Safety Plan.

Appropriate liaison with the emergency services must be initiated by the Site Fire Safety Coordinator.

The Site Fire Safety Coordinator must provide the fire brigade with site plans detailing the following:-

- a). Fire brigade access, fire shafts and fire lifts.
- b). Dedicated emergency escape routes and staircases.
- c). Positions of dry riser inlets and wet risers.
- d). Fire Points.
- e). Temporary buildings and stores within buildings.
- f). Any hazardous items. e.g. HFLs, LPGs, gas mains etc.