1. INTRODUCTION

The Work at Heights Regulations 2005 requires that an assessment is to be undertaken before starting any work at height. If the assessment confirms that there is no alternative to working at height, then suitable work equipment

Ladders provide a simple and easy access solution for a number of work activities that occur at height. Always plan your work that requires the use of ladders as an access tool or a working platform. Ladders are often used when it would be safer to use other equipment, e.g. mobile tower scaffolds. Ladders may be used for short duration work; however this can still be hazardous as many ladder accidents occur during work lasting 30 minutes or less.

2. SAFE SYSTEM

Risk of accident can be substantially reduced by management planning before work starts and by controlling the way work is done. Work people must follow the agreed procedures.

The first question to ask is - can the job be done more safely in a different way? A ladder is a simple, versatile and relatively inexpensive piece of equipment. The temptation therefore is to use it for all sorts of work without considering whether the risk warrants an alternative method. Apart from enabling people to get from one level to another, it is often used as a place of work. Before it is used for this purpose, however, the circumstances need to be critically examined.

A temporary (or, where appropriate, a permanent) working platform or stage, where practicable, is inherently much safer than a ladder, and its use will eliminate most of the factors which cause falls from ladders. In addition a proper platform can often ensure the job is done more quickly and efficiently.

Other factors which have a bearing on whether ladders are appropriate are:

(a) whether the ladder can be securely fixed against slipping outwards or sideways;

(b) the conditions on the site (e.g. exposure, weather, movement of persons or vehicles);

(c) whether the user has a safe handhold and is close enough to the work;

(d) whether the ladder is so long or so flexible that sway and vibration could cause loss of balance;

(e) the ability, training and experience of the users;

(f) the strength, the surface condition and the type of structure against which the ladder is to rest;
SECURING A LADDER

The foot of the ladder should be supported on a firm and level surface and should not rest either on loose material, or on other equipment to gain extra height. Attachments for levelling up the feet on sloping surfaces should be properly fixed and used. In no case should the bottom rung be placed so that the total weight is carried on the rung; only the stiles are designed for this purpose.

It must be ensured that the ladder cannot slip and wherever practicable the top should be securely fixed. Slip may be prevented by the use of a lashing, strap or proprietary clip secured to both stiles or where suitable by equipment such as tie restraining straps or tensioned guys. On slippery floor surfaces special care is necessary to prevent the ladder foot from moving. Whilst lashings etc are being fixed the ladder should be footed.

A ladder fitted with a proprietary spreader arm may be accepted as complying with 32(2) (a) of the Construction (Working Places) Regulations 1966, provided that:

(a) the ladder is in good condition;

(b) the ladder is of suitable quality for industrial use;

(c) the ladder is fitted with non-slip feet; and

(d) the inclination of the ladder conforms with the one-in-four rule.

Although there is no evidence that such proprietary devices cause wear or induce stresses that might make them unsuitable for use with a particular ladder, users are nonetheless recommended to ascertain from the ladder manufacturer whether a ladder is suitable for use with them.

If the surface on which the foot of the ladder rests is not firm and level and does not provide adequate purchase for the non slip feet, additional precautions should be taken to prevent outward movement of the foot of the ladder.

The head of the ladder should rest against a solid surface able to withstand the imposed loads. Where the surface may be frangible or brittle so that it cannot withstand such loads, equipment such as ladder stays must be supplied and used.

Where securing at the top is impracticable, arrangements must be made to prevent the ladder from slipping outwards or sideways. Methods of securing at the base include fixed blocks or cleats, sandbags or stakes embedded in the ground. Additionally, to help prevent slipping, most ladders can be fixed at the foot with pads, caps or sleeves.

In circumstances where it is impracticable to fix the ladder at the top or at the foot, a second person should be stationed at the foot to prevent slipping; this
precaution, however, is considered to be effective only for ladders not more than 5 m (16 ft) in overall length. The person ‘footing’ should face the ladder with a hand on each stile and with one foot resting on the bottom rung.

4. SAFE USE OF LADDERS

4.1 Leaning ladders

The stepping off rung should be level with the platform. Ladders should extend to a height of at least 1.05 m (3 ft 6 in) above the landing place, or above the highest rung on which the user has to stand, unless there is a suitable handhold to provide equivalent support. This is necessary to reduce the risk of overbalancing when stepping off and on at the top.

The ladder should be placed at a suitable angle, ideally at about 75° to the horizontal, i.e. about 1 m out of every 4 m in height. The user should face the ladder when climbing or descending.

A ladder should be used only for the load and purpose for which it is designed. For example, a ladder should not have scaffold boards laid on its rungs and should not be used as an upright of a ladder scaffold unless it is of heavy duty and capable of carrying the loads imposed. The rung of an ordinary ladder is designed to support the weight of a man and whatever light tools he may be carrying, but not the additional weight of a ladder scaffold. A ladder should not be supported on a rung but on its stiles. Only one person at a time should be climbing the ladder.

Ladders with wire reinforced stiles or rungs must have the reinforcement on the underside when in use. Metal ladders, those with metal stile reinforcement, and wet ladders must not be used where any electrical hazard exists.

It can be dangerous for a person to carry loose tools manually up or down a ladder because he may be unable to grip the stiles; this is one of the most common causes of overbalancing. Light tools should be carried in a holster attached to a belt, or in a tool bag. Other tools and materials should be raised or lowered on a rope.

4.2 Extension ladders

Sections of extension ladders should overlap by a minimum of:

- up to 5 m (16 ft) closed length -1½ rungs
- between 5 m (16 ft) and 6 m (20 ft) -2½ rungs
- over 6 m (20 ft) closed length -3½ rungs

The user should raise and lower the ladder from the base and should ensure that the hooks are properly engaged. The rung 1.05 m (3 ft 6 in) from the top of a single section or an extension ladder is the highest to be used for climbing.
4.3 Long ladders

The height for which a ladder will be unsuitable for use depends on the space available, the nature of the work, the physical effort required to erect the ladder and the cost involved, for instance if more than one man is needed to erect it.

Whilst two men may be able to handle a ladder longer than 11 m the weight involved may cause strain injury and beyond this height any movement in the ladder due to slipping or sliding will not be prevented by a single man footing the ladder: other recognised safe methods should be employed.

5. SAFE USE OF STEP LADDERS

Step ladders and trestles are not designed for any degree of side loading and this should be avoided; they should be spread to their fullest extent and properly levelled for stability and should be placed at right angles to the work whenever possible, on a level surface. Work should never be carried out from the top platform nor should overhead work entail overreaching.

The top tread of a pair of steps, bucket or tool shelf should not be used for foot support unless there is an extension above the top to provide a handhold; rear parts of steps should not be used for foot support.

Step ladders are prevented from spreading by means of stays, chains or cords. These should be of sufficient and equal length, kept in good order, and should be renewed if found to be defective.

Only one person should use a step ladder at any one time and if steps are used in a doorway the door should be wedged open securely.

6. CARE AND MAINTENANCE

6.1 Handling

Equipment should not be dropped or jarred. Timber ladders receiving a heavy blow may suffer compression damage, distortion, loosened rungs or cracked stiles. If it is considered that a ladder has been damaged, it should be withdrawn from service. A thorough examination should be undertaken and appropriate action taken where necessary such as repair by a competent person or scrapping.

6.2 Inspection

Ladders should be capable of being individually identified. Apart from inspection before and after normal use they should be examined regularly by a competent person. Ladders found to be defective should be suitably labelled or marked and withdrawn from service until repaired. The inspection should include checking rungs, treads, crossbars and stiles for defect (especially the
presence of compression creases in timber), rung to stile connections, ropes, cables and all fittings, locks, wheels, pulleys, rivets, screws and hinges. A record should be kept of these inspections.

6.3 Storage

Storage areas should be easily accessible. Ladders should be stored on racks designed for their protection when not in use. The racks should have sufficient supporting points to prevent excessive sagging. Materials should not be placed on stored equipment.

Timber ladders should be stored where they will not be exposed to the elements but should have good ventilation. They should not be stored near radiators, stoves, steam, pipes or in areas subject to excessive heat or dampness. Ladders should not be hung from the stile or a rung.

6.4 Transport

Ladders carried on vehicles should be properly supported to avoid sagging and there support point to minimize rubbing and the effects of road shock. Other plant should be carefully loaded so that ladders are not subject to shock or abrasion.

6.5 Painting

Timber equipment may be coated with transparent non-conductive finish such as varnish, shellac or a clear preservative but not with any opaque covering such as paint. Aluminium equipment should be given an adequate protective coating when it is subject to acids, alkalies or corrosive substances. Preservatives for timber components in aluminium should not contain copper salts.

6.6 Cleanliness

It is important that mud or grease etc is cleaned off footwear before any attempt is made to climb a ladder. Where ladders become contaminated they should be taken out of service and cleaned. There should be sufficient space behind the rung to provide a proper footing. Climbing or gripping surfaces should be free from oil, grease or mud or other slippery substances.

6.7 Competent person

The expression ‘competent person’ is not defined in the Regulations but one definition used is that the person undertaking the task should have such practical and theoretical knowledge and actual experience of the type of machinery or plant which he has to examine as will enable him to detect defects or weaknesses which it is the purpose of the examination to discover and to assess their importance in relation to the strength and functions of the machinery or plant. In other words, the competent person must not only be able to discover defects but must be able to tell what effect they are likely to have.
Possible defects to be checked

Timber ladders should be checked for rot, decay or mechanical damage such as warped stiles, excessive cracks, splintering and wear and tear at the head and foot of the stiles. Rungs should be checked for any looseness, excessive wear or decay where the rung enters the stile. Metal ladders should be checked for twisting, distortion, oxidisation, corrosion and excessive wear, especially on treads. Glass reinforced plastics ladders should be checked for mechanical damage.

Broken or loose rungs, defective tie rods and broken rivets, loose hinges or other defective metal fittings should be properly replaced and sufficient lubrication of working parts ensured.

Cords, chains and ropes should be checked and replaced if defective, and pulleys should be lubricated regularly. Missing or defective pads or sleeves should be replaced.

7. BASIC CHECK LIST FOR MANAGEMENT, SUPERVISORS AND USERS

Employers and employees and all users of ladders should be able to answer ‘Yes’ to each of the questions, or to the alternatives given, before a job is started.

1 Is a ladder, step ladder etc the right equipment for the work?

2 If so, is the equipment in good condition and free from slippery substances?

3 Can the leaning ladder be secured at the top? If not,

   (a) can it be secured at the bottom?

   (b) if (a) cannot be achieved, will a second person stationed at the base provide sufficient safety?

4 Is the top rung level with the platform? Is there adequate handhold at the place of landing?

5 Are there platforms at 9 m maximum intervals?

6 Is the ladder angle correct?

7 Is the support for the ladder adequate at both the upper point of rest and the foot?

8 Is the ladder properly positioned?

9 If it is necessary to carry tools and equipment, has provision been made for carrying them so that the user can keep his hands free for climbing?
10 If an extension ladder is used is there sufficient overlap between sections?

11 On step ladders are the stays, chains or cords in good condition?

12 Can the step ladder be placed sufficiently near the work on a firm level surface?

13 Is the ladder clear of overhead electric cables?