

SG25:14

Access and Egress from Scaffolds, via Ladders and Stair Towers etc.



1. INTRODUCTION

This document gives scaffold companies and clients guidance on the Work at Height Regulations 2005 (WAHR 2005) relating to safe means of access to and from scaffold working platforms.

The WAHR 2005 states that ladders should only be used for work at height if a risk assessment under Regulation 3 of The Management of Health and Safety at Work Regulations 1999 has demonstrated that the use of more suitable work equipment (e.g. a staircase) is not justified because of the low risk and short duration of use, or there are existing features on site which cannot be altered.

The Construction (Design and Management) Regulations (CDM) outlines that clients, CDM co-ordinators and designers should consider what form of access may be needed at the planning stage. This should include any emergency escape routes that have been identified by the risk assessment and preferred option for access/egress and the required number of access points

On larger projects powered passenger/goods hoists may be a safer option if available. Where passenger hoists are used, an additional means of access will be required for emergency purposes (e.g. in the event of a fire or mechanical failure).

All equipment, including staircase components and ladders, must be inspected and maintained in compliance with the Provision and Use of Work Equipment 1998 (PUWER 1998) and all relevant British and European Standards.

On existing buildings it may be possible to use permanent staircases to gain access to the scaffold; however, for many applications the starting point for consideration by the client should be an access staircase that can be adapted to suit all scaffold types, followed by ladder access towers or bays (see **Figure 1** and **2**).

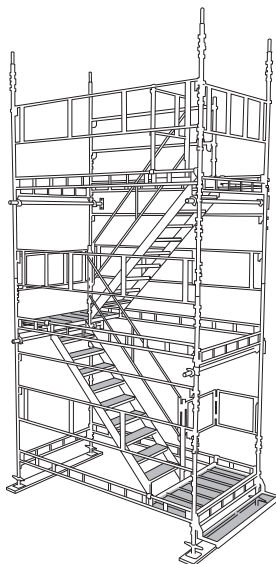


Figure 1
Proprietary system scaffold stair tower

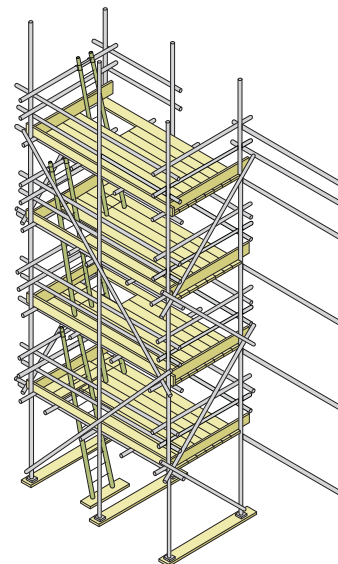


Figure 2
Ladder access bay with single lift ladders

Where such access solutions are not reasonably practicable, internal or external ladder access may have to be considered.

However, HSE inspectors will expect all parties, clients, principal contractors and subcontractors to give careful consideration to the various ways of achieving safe access and egress and all may be asked to explain the reasoning behind any of their decisions. Principal contractors are now becoming more aware of the need to consider safer means of access to scaffolds and will be specifying stair towers and ladder access towers at various points on the scaffold.

The NASC advise that access points should be no more than 30.0m apart, subject to a suitable risk assessment.

Considerations that need to be made by clients, CDM co-ordinators and designers regarding the assessment of suitable access and egress from scaffolds may include:

- Length, width and height of scaffold;
- Number of people using the scaffold at any one time;
- Duration of scaffold hire;
- Type of work to be undertaken on scaffold (e.g. access to confined space entry work and asbestos removal enclosures whilst using full face respirators etc. requires a higher degree of assessment for access and egress);
- Emergency and evacuation requirements (Fire, Toxic Gas alarms etc.) may, for instance, require additional access points.

Hierarchy of Control:

1	Staircases
2	Ladder Access Bays with Single Lift Ladders
3	Ladder Access Bays with Multiple Lift Ladders
4	Internal Ladder Accesses with Protection i.e. ladder trap hatch / handrails etc
5	External Ladder Accesses Using a Safety Gate / Swing Arm System
6	Other

2. STAIR TOWERS

There are various Proprietary Staircases on the market to choose from. Scaffolding companies should ensure that the equipment that they plan to purchase or hire meets the requirements of the planned application. There are alternative versions of 'original' systems, which are visually similar. These systems can be constructed in unison on the provision that the product attains the standard outlined in the NASC Guidance 'Code of Practice for the Hire and Sale and Use of System Scaffolds'. When mixing original systems with alternative versions the scaffold must be erected to the lower capacity specification.

When proprietary staircase equipment is purchased, manufacturer's instructions, user guide and specifications must be provided to the purchaser.

Competence

Scaffolders should have received appropriate training in accordance with the manufacturer's standards for the proprietary stair system which, as a minimum, should cover the erection, altering or dismantling of the equipment. Note that tube and fitting stairways are covered on the CISRS Advanced Scaffolders and NVQ level 3 training course.

Preparation of the Foundation

As with the construction of scaffolding, it is the client's responsibility to prepare a suitable foundation that is firm and level to ensure that the load bearing capacity of the ground can support the load imposed by the stair tower.

Setting Out

The stair tower should be set out to ensure that it is set as close to the main access scaffolding as is practically possible. Any gap between the stair tower landing platform and the working platform of the scaffolding should be suitably closed.

Care should be taken when planning platform heights of proprietary stair towers, when they are used to access scaffolding constructed from tubular material and fittings. This will ensure that the platform heights of the tower align as close as is practically possible with the working platforms of the scaffolding.

Ties

Proprietary stair towers should be physically tied or suitably stabilised to the permanent or scaffolding structure as specified by the manufacturer.

Design

Proprietary staircases are generally designed for most site and work applications; however manufacturers do produce standard configurations for proprietary stairways in system scaffolding that may require further consideration in mating to the scaffold. In such cases consult the manufacturer's instructions for use. System scaffolding stairways should be designed in accordance with BS EN 12810. A stair tower constructed from tube and fitting components or a mixture of tube, fittings and prefabricated treads or flights of stairs will be subject to engineering design and should be designed in accordance with the relevant standards (e.g. BS EN 12810, BS EN 12811 and TG20:13).

NOTE: tube and fitting staircases erected up to a height of 1.5m high do not require a design.

When a stair tower is attached to a scaffolding structure, there may be design implications. If the stair tower is attached to a scaffolding structure constructed from system scaffolding, then it will be necessary to refer to the system scaffolding manufacturer's guidance.

3. TEMPORARY STAIRCASES FOR THE PUBLIC

The erection of Temporary Staircases for the Public can be a complex issue and will be subject to engineering design in all cases, which will require the designer to consult the relevant Building Regulations, Fire Prevention Regulations (some of which are cited in References), together with the Principal Client and all relevant interested parties (e.g. Network Rail, National Grid etc, who may have specialist requirements on their projects), prior to the issue of the design.

The following gives the scaffold designer guidance on relevant sources of information.

If it is necessary to provide a stair tower for public access or escape it will also need to comply with the requirements of HSG168 Fire safety in construction (as well as the relevant Regulations – please see References for lists of some of the relevant regulations for England and Wales, Scotland, and Northern Ireland).

NOTE: HSE Publication: HSG168 Fire safety in construction gives applicable fire safety guidance (including information about staircase towers as fire escapes, provided in Part 2, Sections Sheeted scaffolds and External escape stairs and ladders).

There are specialist proprietary stair towers available which are suitable for public access and escape. Fire escape stair towers for the public must be fit for purpose (i.e. capable of withstanding live loads of large

number of people running down stairs). For instance, the Approved Documents: B, K and M of the Building Regulations sets the minimum standards for fire safety, the safety of stairways etc in England and Wales (similar Fire Safety Regulations etc cover Scotland and Northern Ireland – please see References) and access to buildings, and must be complied with. If it is not practicable to conform to the requirements of Approved Document, K, for instance, it is advisable that the client seeks the agreement of the relevant regulatory authority

Some proprietary staircases designed and supplied as public access and escape stairs may be constructed with drainage holes in the platform deck units. The user should be advised to cover the holes to ensure that footwear such as stiletto heels cannot become trapped.

Non slip surfaces to treads and platform decks should be considered in accordance with the client's requirements. This may also extend to panels fitted to the risers of stairs for vanity or anti-litter purposes.

4. LADDER ACCESS BAYS

Ladder bays can be separate structures fixed to the external face of the scaffold or built independently and are used solely for access and egress. Where more than one ladder is being used they should be installed in a parallel rather than a zigzag pattern. In general separately constructed ladder bays should not require any further additional protection to the ladder opening.

The use of either single lift or multiple lift ladders is acceptable (see Figure 2).

It is recommended that access to the lifts or ladder access openings are suitably protected.

4.1. Boarded Lifts

Boards less than 2.1m in length must be physically tied to the scaffolding with suitable fixings and supported at the correct centres to prevent tipping.

The access opening for the ladder should be as small as practically possible but to be no less than 450mm x 600mm.

4.2. Design

When a ladder access tower is attached to a scaffold, that scaffold may be subject to engineering design. Particular attention should be paid to the external ledger and standards of the scaffold, as this will often be shared with the ladder tower. Refer TG20:13

The superimposed loading adopted in the calculations should be no less than 1.5kN/m^2 for all platforms.

5. TYPES OF LADDER ACCESS

Ladder access openings should be protected to prevent a fall. This can be achieved by locating the ladder access away from the immediate working platform, whenever practical (see **Figures 2 and 5**), by providing a proprietary self-closing gate (see **Figure 3**), by installing a pivoting guardrail (see **Figure 6**) or by installing a ladder trap hatch (see **Figure 4**).

NOTE: Scaffold users must ensure that ladder trap hatches are in the closed position when not in use. The NASC recommends that external ladder access is restricted to the first and second lift only (with maximum height of 4.7m, which would be a 2.7m base lift with an additional 2m lift).

When fixing a single lift ladder at the first lift, consideration should be given to supporting the ladder at a higher level to prevent the ladder from tipping. This support could be achieved by supporting the ladder at guardrail height (please see **Figure 3** for an example).

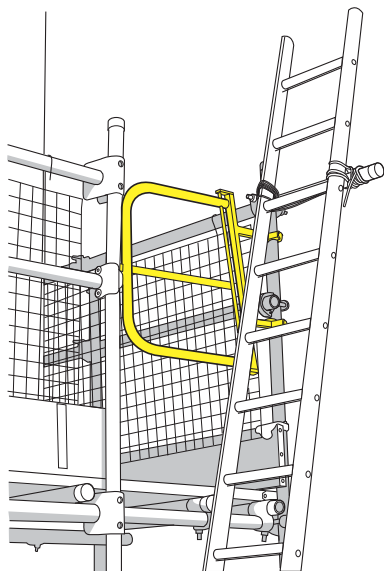


Figure 3
External ladder access using a safety gate

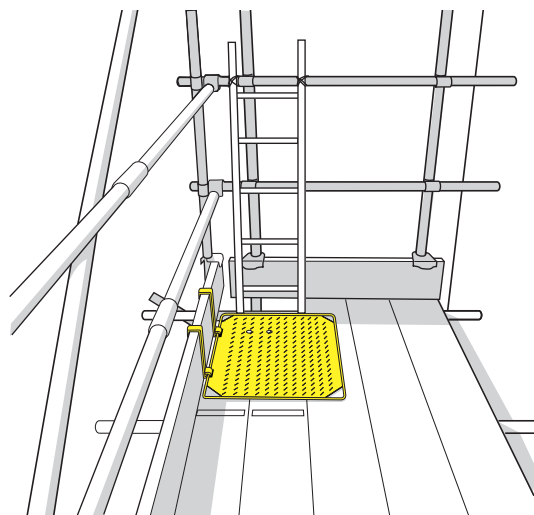


Figure 4
Internal ladder access using a protected ladder trap

Where the client specification does not clearly specify the type of ladder access required, the scaffolding contractor should always consider providing, where practicable, the safest means of access possible.

Should the client request a means of access that is not considered best practice, then this must be clearly stated on the handover certificate issued to the client / hirer.

Although the HSE expects the client to be responsible for this issue, they would also look to the scaffolding contractor to provide guidance to the client on what will be provided in order to meet their statutory duties relating to safe access. It is no longer acceptable for the scaffolding contractor to say that they gave the client what they wanted or could afford. Whatever the scaffolding contractor provides it should, as a minimum, meet the legal requirements.

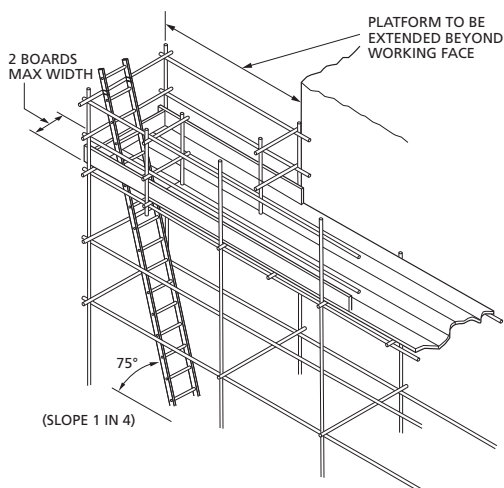


Figure 5
Extended platform and staggered guardrail

This type of ladder access provides a safe means of access and egress. A staggered system of guardrails has been fitted to prevent accidental approach to the ladder opening.

This type of ladder access point should also be positioned as far away as is practicable from the main are of work for example at the end of the access scaffold.

NOTE: Where it is not practical to extend the platform beyond the working face, and subject to a suitable risk assessment, ladders in sequence (each one directly above the other inside the scaffold) can also provide a degree of fall protection, especially if operatives are working in a different area, away from the ladders.

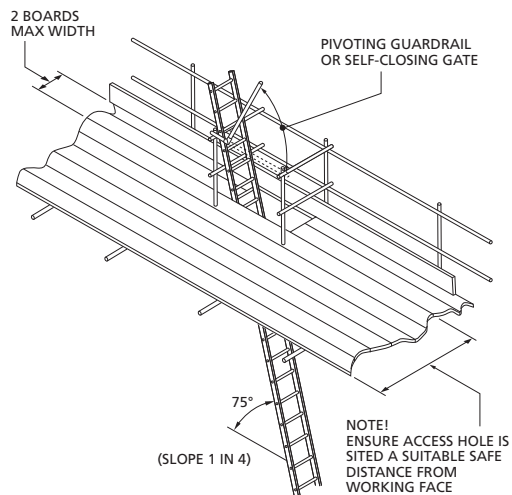


Figure 6
Pivoting Guardrail or self-closing gate

This type of access can be used near to the work place because the guardrails have been placed around the access point, complete with a pivoting guardrail or self-closing gate, to prevent accidental approach by users.

Care must be taken when positioning the access ladder to ensure the working lift is not unduly restricted.

6. LADDER SAFETY

6.1 Ladder Classification

If you have responsibilities for ladders used in scaffolding activities then you must ensure that the ladders that you specify, purchase and use, are safe and fit for purpose.

- Ladders should be manufactured and tested to EN131 or in accordance with that relevant standard;
- Ideally, ladders should be tested / certificated by an accredited test authority (such as BS);
- Conform to the relevant standards or meet the strength and dimensional requirements of those standards where the material is outside the scope of the standard;
- Produced by a manufacturer with an accredited ISO quality management system and supplied with labelling which enables you to identify the manufacturer (e.g. includes the license number).

6.1.1 Standards for Ladders Suitable for Use in Scaffolding Work

Standard	Material	Max Safe Working Load	Max Static Load ¹	Application
EN131	All	110kg	150kg	Frequent use in reasonable conditions
BS2037 Class 1 Industrial	Aluminium only	130kg	175k	High frequency use in onerous conditions (such as power stations)
BS1129 Class 1 Industrial	Timber only	130kg	175kg	

Notes:

1. Ladders made from other materials, such as steel, can be tested to the strength requirements of BS2037 but cannot be licenced to BS2037. They can only be licensed to EN131.
2. BS2037 and BS1129 Class 3 ladders are for domestic use only and are not suitable for scaffolding work.

The NASC do not recommend the use of extension ladders for standard scaffolding operations; however, clients may wish to use extension ladders to gain access/egress to the 1st or 2nd lift of scaffolds where it is not practicable to leave a ladder in situ, or to safely store a rigid ladder due to security concerns. In this event, the client is responsible for assessing the risk and for arranging suitable and sufficient training for operatives in erecting/dismantling ladders.

Fibre glass type ladders may be requested for use by clients in special situations, where timber and metal ladders cannot be used. Such ladders are to be used as manufacturer's instructions.

6.2 Timber Ladders

Timber ladders conforming to BS1129 / BS EN 131 are suitable for most scaffolding applications but such ladders must be closely inspected as damage to timber ladders may not be obvious.

Care should be taken in handling so that they are not overloaded or dropped from a height.

Correct storage is necessary so that the styles do not warp or the rungs become loose and scaffold contractors should refer to the manufacturer's instructions for advice on storage.

Ladders should be used with the wire tie rods beneath the rungs and the wire stile reinforcement on the underside of the stile.

6.3 Metal Ladders

Metal ladders manufactured and tested to EN131 or in accordance with that relevant standard are suitable for most scaffolding operations.

While ideally metal ladders should be manufactured and tested to EN131, many of the metal ladders in use today are not manufactured to EN131, the NASC consider them fit for purpose in scaffolding applications and they do not have to be replaced unless unserviceable. These galvanised steel pole ladders were originally introduced as a heavy-duty robust alternative to the timber pole ladders that were used predominantly by the scaffolding industry. At that time (approximately 20 years ago or more) there were no European Standards for steel ladders and the only materials covered in British Standards were timber (BS1129) and aluminium (BS2037).

When these ladders become unserviceable, they should be replaced by ladders which meet the requirements of EN 131 or meet the strength, dimensions and rung requirements of Class 1 as defined by BS2037.

A safety alert on pole ladders was erroneously published following a HSE prohibition served on a non-NASC scaffolding contractor and which was later withdrawn. The retraction was published on the NASC website, drafted in consultation and co-operation with the Health & Safety Executive (HSE) and the Ladder Association:

Please see: <http://www.nasc.org.uk/wp-content/uploads/2018/07/Steel-ladders-docs.pdf>

NOTE: in areas where there is the potential for contact with an electrical hazard or chemical corrosion, consideration should be given to whether or not the use of a metal ladder would be appropriate.

6.4 Access to and From Ladders Within a Scaffolding Structure

All ladders used for access shall be long enough to extend sufficiently above the working platform, unless other measures have been taken to ensure an adequate handhold. (The NASC would recommend a minimum of 1.0 metre.) Ladders should be fixed at an angle of 65% to 75% (to judge the angle use the angle indicator marked on the stiles of some ladders or use the 1 in 4 rule, which is 1 unit out for every 4 units up).

In the event that there is a potential risk of a fall over the guardrail while climbing a ladder between landing platforms, the introduction of additional guardrails to the external face of the scaffold will need to be assessed (and provided if required by the risk assessment).

Suitable access to the working platform must be provided at the stepping off point. Persons should not be required to climb over or under guardrails or over toe boards to gain access to the working platform. Any gaps in the guardrails or toe boards at the access point should, however, be kept as small as reasonably practicable.

The NASC would recommend that self-closing safety gates or pivoting guardrails should be used.

Suitable safe landing areas or rest platforms must be provided when the vertical distance between two successive landing places exceeds 9.0m although more regular rest platforms are recommended.

The competent person must inspect all ladders as per the statutory requirements of the Working at Height Regulations 2005 (please see item 6.5), but the user also has a duty to inspect a ladder before accessing it for the first time at the beginning of the shift.

It is recommended that the user should remove any contamination from the ladder, such as wet paint, mud, oil or snow before use and wear suitable footwear with strong, soled, flat footwear with a good grip and laces tied properly when climbing ladders. Failure to follow this advice presents dangers and a risk of a fall.

More specific details for ladder requirements can be found in the Work at Height Regulations 2005 (WAHR) Schedule 6.

6.5 Inspection of Ladders

In order to comply with Regulation 12 of the WAHR, all work equipment including ladders should be inspected at suitable intervals to ensure it is fit for purpose. All ladders must be inspected for worthiness before leaving the scaffold yard and also before use by the lead scaffolder on site prior to installation (scaffolders are trained to inspect ladders on their CISRS courses).

Where the ladder is part of the scaffold structure, the inspection of the ladder is included in the inspection report and there will be no requirement for a separate ladder inspection.

NOTE: some clients may require a more detailed inspection report, which would involve a contract specification.

These statutory inspections must be carried out at least once every 7 days; following inclement weather; following authorised alterations; and any event likely to compromise the structural integrity of the scaffold.

Where ladders do not form part of the scaffold structure, the inspection of the ladder must be included in a separate ladder inspection report.

NASC recommend that clients carry out regular monitoring of the scaffold structure, including ladders, to ensure that no unauthorised modifications are carried out by others and that users are instructed to inspect a ladder before accessing it for the first time at the beginning of the shift.

During the inspection the competent person will check for faults, including the following:

Timber ladders:

- That the ladder is not painted (although security painting can be used in moderation and clear varnish);
- That there are no splits, cracks, splintering, warping or bruising;
- The rungs show no significant signs of undue wear or movement;
- That all rungs are in place;
- That wedges and tie rods are tight;
- That metal reinforcements are correctly positioned;
- That the feet are not split or fraying.

Metal ladders:

- That metal ladders show no signs of mechanical damage, corrosion or chemical attack;
- That there are no splits, cracks or warping;
- That timber or plastic inserts to metal ladders are in place and not missing;
- The rungs and stiles show no significant signs of undue wear, movement or metal fatigue;
- That all rungs are in place.

General:

- Hired or loaned ladders must have letters of conformity.

In scaffold yards, the competent yard operative must have appropriate training on the inspection and maintenance of ladders. If a ladder cannot be properly repaired or serviced then it must be scrapped and disposed of in an appropriate manner.

Further guidance can be obtained from the ladder manufacturer or supplier.

6.6 Securing Ladders

The Work at Height Regulations 2005 sets out the requirements for ladders.

Ladders should only be used on level ground or scaffold platform and should be positioned to ensure their stability during use and secured immediately. It is critical that ladders are properly secured by a competent person to prevent accidental movement. The NASC recommend that ladders are secured by square lashings, using suitable rope or wire, proprietary ladder couplers, cable ties of sufficient strength and use, or scaffold fittings (where the use of such fittings cannot damage metal ladders). The selected method should ensure that the ladder is safely and securely fixed to the scaffold structure and there is no lateral movement of the ladder.

Where the ladder cannot be tied off by a competent person standing on the platform, the ladder should be temporarily restrained at the base before being secured at the top of the ladder (i.e. another operative footing the ladder to allow his team mate to safely walk up the ladder and secure it at the top; and with the reverse operation used to remove the ladder during the dismantle operation). Footing will only be used in the installation and subsequent removal of a ladder for platforms in excess of 2.0m.

Ladders shall be prevented from slipping during use by securing both stiles at the top of the ladder (although some clients may require additional ties on the middle of the ladder and at the base). Where this is not practicable, ensure the stability of the ladder is supplemented by an effective ladder stability device.

NOTE: where ladders are tied off, care must be taken to ensure that the support tube is either directly behind or immediately below the rung (see **Figure 7** for examples of good practice).

Ladders should not be used if there is any possibility of the ladder being struck by passing vehicles unless they have been protected with suitable barriers.

When the correct device has been selected it is also important to ensure that it is applied and fixed correctly. The method of tying should ensure that both stiles are adequately fixed to the ladder support. The ladder must be tied to a suitable anchor point, making sure that both stiles are tied, see **Figure 7**.

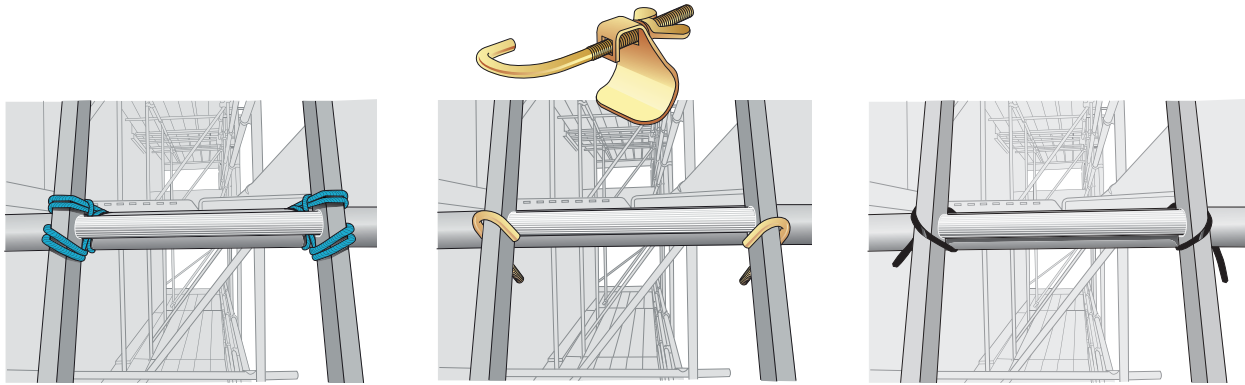


Figure 7
Typical methods of securing a Ladder

Care should be taken to ensure that there are no protruding tubes that could cause a trip or other obstruction for the full height of the ladder. For instance, a support tube that is erected much lower than the rung can create a “false step” which is likely to cause an accident.

6.7 The use of Ladders within scaffolding structures

Once the ladder is secured, users should have both their hands free for climbing up or down the ladder and should maintain three points of contact with the ladder at all times. Tools or other small items should be carried in a belt or backpack or similar.

It is recommended that ladders should not be used when carrying materials. On a ladder, where you must carry something, you must have one hand free to grip the ladder.

It is important that the use of ladders on site is properly controlled by the scaffold contractor during erection, alteration and dismantle of the scaffold and by the client during use.

6.8 The use of Ladders as Places of Work

NASC do not recommend the use of ladders as a place of work, especially when used to erect or dismantle scaffolding (and there are other suitable access platforms such as podiums, examples of which can be seen in SG4).

7. SECURITY

It is the responsibility of the client / hirer to prevent any un-authorised access onto the scaffold structure. The user / hirer should provide clear instruction to the scaffolding contractor at tender stage of any measures that are to be supplied by the scaffolder in this respect.

Unauthorised access to the Scaffold should be prevented at all times. This can be achieved by various methods including a ladder guard, when the scaffolding is not in use (see **Figure 8**).



Figure 8

The NASC recommends that ladders for the first lift are removed when not in use and kept in a secure storage area, where possible, and that stair towers should be fenced and secured.

8. REFERENCES

The Health and Safety at Work Etc 1974;
 Construction (Design & Management) Regulations [latest revision];
 The Work at Height Regulations 2005;
 The Management of Health and Safety at Work Regulations 1999;
 The Workplace (Health, Safety and Welfare) Regulations 1992;
 Provision and Use of Work Equipment Regulations 1998;
 BS 5395 – 1:2010 Stairs, Code of Practice for the Design of Stairs with Straight Flights and Winders (Table 1);
 NASC – Code of Practice for the Hire, Sale and Use of System Scaffolds;
 BS EN 12810 and BS EN 12811;
 TG20 [latest revision];
 TG12 Tying down of scaffold boards [latest revision];
 HSE Publication: HSG168 Fire safety in construction.

NOTE: there are different regulations etc covering England and Wales, Scotland, and Northern Ireland:

England and Wales:

The Regulatory Reform (Fire Safety) Order 2005;
 Building Regulations [latest revision], including Approved Documents: B, K and M.

Scotland:

Fire (Scotland) Act 2005;
 Building Regulations (Scotland) 2004;
 Technical Handbooks 2013 (Domestic and Non domestic) Sections 2.9, 4.1 and 4.3.

Northern Ireland:

Fire Safety Regulations (Northern Ireland) 2010;
 Building Regulations (Northern Ireland) 2012;
 Technical Booklets E, H and R.

Whilst every effort has been made to provide reliable and accurate information, we would welcome any corrections to information provided by the Writer which may not be entirely accurate, therefore and for this reason, the NASC or indeed the Writer, cannot accept responsibility for any misinformation posted.



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