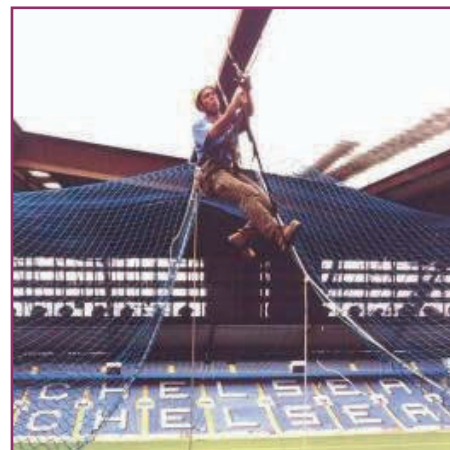
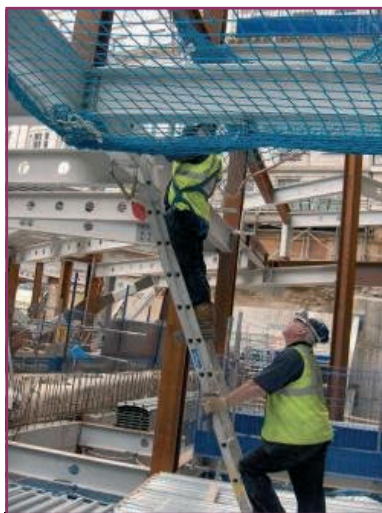


FASET

Fall Arrest Safety Equipment Training

Best Practice Guide

The selection of access methods to install and dismantle safety netting



Foreword

FASET is the trade association for the safety net rigging industry. This document has been prepared by the FASET Health and Safety Committee with assistance from the Health and Safety Executive (HSE) and gives general guidance on the various access methods available for rigging safety net fall arrest systems. The aim is to outline the principle methods available in order of priority and to give advice and guidance to rigging contractors and clients alike on the safe systems of work recommended by FASET.

“Although HSE has not produced this guidance, we were consulted during its development and we generally support the advice given, which could help ensure compliance with the law.” – David Thomas, CEng, FICE, CFIOSH. HM Principal Specialist Inspector of Health and Safety (Construction) HSE. Construction Division Technology Unit.

The CDM regulations place duties on principal contractors to plan, manage and monitor construction, prepare and make available the relevant sections of the health and safety plan and check that the work is executed by competent contractors. The regulations also place duties on all contractors to co-operate with the principal contractor in planning and managing work, and reporting problems and hazards on site.

This guidance does not include specific measures to be taken by rigging contractors to ensure their operatives remain safe on construction sites in general, as advice on this is widely available from other sources such as *HS(G)150 – Health and Safety in Construction*.

The method of access chosen by a rigging contractor should always be justified by an appropriate risk assessment, and the methodology included within a site specific method statement.

Introduction

Safety net installation is still a relatively new discipline within the construction industry and continues to evolve. Work at height by its very nature can be hazardous and there is a degree of risk to safety net riggers who install the safety net system for other trades to work above.

The Work at Height Regulations (WAH Regs) 2005 came into force in April 2005 and outlines the measures that employers must take to comply with the law. The regulations apply to all work at height where there is a risk of a fall liable to cause personal injury. The regulations call for collective protection measures to be used rather than personal protective measures wherever reasonably practicable.

Regulation 6 of the WAH Regs details a simple hierarchy for managing and selecting equipment for work at height. This hierarchy requires the following measures:

1. Avoid

Avoid work at height wherever reasonably practicable.

2. Prevent fall

If it is not reasonably practicable to avoid WAH then adopt the most suitable method of working, and select the most suitable equipment for work at height, which prevents falls occurring.

3. Mitigate

If it is not reasonably practicable to prevent a risk of a fall then measures should be taken to mitigate the consequences of a fall (have measures in place to arrest a fall should one occur).

Regulation 7 covers the principles for selection of work equipment for working at height, and requires employers to take account of:

1. The working conditions and the risks to the safety of persons at the place of work where the equipment is to be used.
2. The distance and consequence of a fall.
3. The duration and frequency of use.
4. Select suitable work equipment by assessing the overall risk eg — risks from site conditions, erection, dismantling etc.
5. The need for timely evacuation and rescue in an emergency.
6. Any additional risk posed by the use, installation or removal of that work equipment or by evacuation and rescue from it.

FASET Recommended Hierarchy for Work at Height:

There are four methods of access currently recommended for rigging and de-rigging safety nets which should be considered in the following order:

1. Rig / de-rig Safety Nets remotely —Using remote attachment devices.
2. Rig / de-rig using powered access — (MEWPs).
3. Rig / de-rig using ladders — (recommended maximum height 4.5m).
4. Industrial climbing access techniques.

Note

FASET do not recommend the use of scaffold towers or hop-ups for the rigging and de-rigging of safety nets under normal rigging conditions. There may be rare and isolated occasions for specific work where towers may be appropriate, having taken due regard of this document, and the hierarchy set out within. Where such occasions arise the rigging contractor must prepare a suitable specific risk assessment taking account of the rigging conditions and the additional control measures required. Towers must always be erected in accordance with the manufacturers/suppliers instructions by trained personnel.

Remote attachment devices

They are relatively recent developments for attachment of safety netting to structural steelwork. They allow rigging/de-rigging to be carried out remotely from the level below, and therefore do not expose riggers to any risks associated with working at height. The safety net border rope is usually placed into the beam attachment device and offered up into position via a pole, with the rigger standing on a floor below.

There are limitations that need to be considered with this method of installation, the principal ones being:

- **Installation height:** the higher the reach the more difficult it becomes to locate the device onto the bottom flange of the steelwork and the greater the lever arm created. Care must be taken to avoid the risk of musculoskeletal injuries as there is more strain on the riggers back and shoulders during rigging and de-rigging as the height from the ground increases.

- Dependent on the steelwork arrangement and weather conditions, additional fixings such as rope ties are sometimes required at the corners of the net to prevent movement during rigging. Installation of rope ties or similar will involve the rigger working at height to attach them, usually from a footed ladder; however this is for a short duration only, and the overall WAH is considerably reduced.
- Remote positioning devices can only be attached to I section beams. Other methods of attachment will be required to steel channels, angles or box sections etc.
- The limitations in reach will usually restrict the practical use of these devices to floor decking type applications.

It is important to always follow the manufacturers instructions for use and to ensure that the level the riggers are working from is fully handrailed and clear of materials plant and equipment that could impede the safe installation of the nets above.

Powered Access (MEWPs)

Where it is not reasonably practical to use remote positioning devices, powered access should always be considered. Mobile elevated work platforms (MEWPs) are generally considered as the best method of access for rigging nets to roofs and floors, where clear access and suitable ground conditions exist.

The safe use of MEWPs on site is dependant on various conditions; however the following can be used as guidance;

- Riggers must be suitably trained (IPAF/CPCS or equivalent), and experienced to use the type of machine chosen. Riggers must also wear suitable safety harness conforming to BS EN 361 and work restraint lanyard to BS EN 354. When working aloft the lanyard must be attached to the designated anchorage point within the basket.
- It is essential that the correct type of plant is specified for the intended work and the location is inspected for hazards (1), and an appropriate machine is chosen for the ground conditions on site, for example trenches should be adequately backfilled and other hazards such as manholes barriered off, or adequately covered. The working area should be zoned off to restrict access for other trades during safety net rigging. The responsibility for undertaking this must be agreed prior to work commencing.

- The MEWP must be thoroughly examined in line with the Lifting Operations and Lifting Equipment Regulations (LOLER). A copy of the last inspection certificate must be available (5). The machine must also be maintained in line with the manufacturer's recommendations during its time on site.
- If outriggers are fitted to the machine they must be fully extended when in use.
- MEWPs must only be used within the manufacturer's recommended wind speeds and the maximum safe weighing load (SWL) must not be exceeded.
- If MEWPs are operating in areas where other plant or machinery is in use then the work area should be zoned off. The responsibility for undertaking this must be agreed prior to work commencing.

Additional care must be taken if MEWPs are used to manoeuvre up through several levels of steelwork to rig safety nets to upper levels, as there is a risk of the operator becoming trapped and injury should the boom or basket strike the steelwork, especially during traversing. This risk increases with the number of levels the MEWP operates through, and if materials such as floor decking bundles are loaded out onto the lower levels, as there will be reduced clearance for the MEWP to manoeuvre. There is also a risk that materials could be dislodged by the boom or basket of the MEWP.

Rigging contractors and their clients should always discuss and agree the method and sequence of work in these circumstances at an early stage as depending on site conditions it may become more hazardous to use MEWPs than it is to use other forms of access.

On multi-storey construction where the use of remote positioning devices is not suitable, early planning and programming may make it possible to sequence works on site so that floors can be concreted to allow small MEWPs or scissor lifts to be operated from the floor slab to reach higher levels.

Checks must be made to ensure that the maximum axle loads imposed by the MEWP can be safely transferred to the slab and supporting steelwork. Consideration should also be given to the provision of barriers or wheel stops in from the perimeters of the floor to ensure that machines cannot accidentally reach the edge of the building.

A risk assessment should always be prepared to demonstrate the most suitable method of work.

For further information please refer to:

- *International Powered Access Federation (IPAF)
Operators' Safety Guide for Mobile Elevated Work Equipment*
- *HSE Information sheet MISC614
Preventing falls from boom-type Mobile Elevated Work Equipment*

Use of ladders for rigging safety nets

The Work at Height Regulations limits the use of ladders to instances where a risk assessment can demonstrate that they are the overall least risk option available. The use of ladders for rigging safety nets can only be justified where it is not reasonably practicable to rig nets remotely, or to use MEWPs as a means of access.

HSE guidance note INDG402- Safe use of ladders and step ladders – employers guide; states that ladders should only be used for short duration work. Although ladders may be used continually throughout the day during safety net rigging ⁽²⁾, it will usually take less than 2 minutes to attach the net at each location, and it therefore a short duration activity at each location.

Regulation 8(e), Schedule 6 —Work at Height Regulations 2005 stipulates the requirements for ladder. It states:

Every employer shall ensure that a ladder is used for work at height only if a risk assessment under Regulation 3 of the Management Regulations has demonstrated that the use of more suitable work equipment is not justified because of the low risk and -

- (a) the short duration of use; or*
- (b) existing features on site which he cannot alter*

Careful consideration must therefore be given prior to choosing a ladder as the access method, and must always be backed by a suitable risk assessment and detailed method statement, specific for the work to be carried out.

During ladder use it is not possible to eliminate the potential for a fall; however this potential can be significantly reduced by taking the following steps:

1. Train riggers in the correct use and inspection of ladders.
2. Tie a ladder to a suitable point making sure both stiles are tied.
3. Where tying is not practical ⁽²⁾, then use a ladder stability device to prevent a ladder from sliding during use. It is always better to have a stability device fixed to the top of the ladder as opposed to the foot of the ladder.
4. Where neither (2) nor (3) are practical then the ladder must be footed **at all times** during use and where practical wedged against the steelwork at the top to prevent lateral movement.
5. Maintain 3 points of contact on the ladder at the work position. A safe system of work should be developed to ensure that contact with the ladder is maximised wherever possible. Additional measures may be necessary such as clipping onto the steelwork to maintain 3 points of contact.
6. Do not overload a ladder or over reach from it. Move it to suit each work position, so that the work position is directly in front of the rigger rather than stretching to either side. Keep both feet inside the stiles and on the same rung throughout the task.
7. Use a suitable ladder for the surface it will be used on. Manufacturers should indicate the type of surface it is intended for.
8. Place the ladder at the correct angle (1 unit out for every 4 units up). Where the work height is varied i.e. on pitched roofs, then extendable ladders conforming to Class 1/2 or EN 131 may be more suitable than a fixed length ladder.
9. The ladder must be positioned on firm level ground capable of spreading the load.
10. Unless the manufacturer states otherwise a ladder must not be used on a side slope of more than 16 degrees or a floor slope of more than 6 degrees, but the rungs still need to remain level.
11. Daily user inspections of ladders should be carried out and be supplemented by a formal inspection by a competent person, recorded in writing.
12. Manufacturer s guidance must be followed at all times.

Note

HSE research has shown that training and awareness in the selection and use of ladders is key to ensuring the safe use of ladders. It is therefore important to ensure that operatives who use ladders as work equipment have been suitably trained, and that the ladders themselves are suitable for the task and subject to a daily user check and planned inspection and maintenance regimes.

HSE Research has also shown that there is a risk of ladders flipping when the users overstretch sideways to reach a position. It is therefore important to ensure that ladders are continually moved to a point where the safety net can be reached without stretching.

Mitigating the consequence of a fall from ladders

There is an additional risk when working around perimeter of buildings and internal openings above level 1, as there is a potential for a fall from a ladder and outside the footprint of the building. This risk **MUST** be controlled by the rigger wearing a full body harness and fall arrest device attached to a suitable anchorage point above or behind him to ensure that a fall over the perimeter of the building is prevented.

Maximum working height from ladders

FASET recommend the use of ladders to a height of **4.5m**, under normal circumstances ⁽³⁾. This takes account of the increased risk of injury to riggers should a fall occur. It also takes account of the difficulty in constantly manually handling ladders into position on heights in excess of 4.5m.

For further reference please refer to the following HSE documents:

- *INDG 402 – October 2005*
Safe use of ladders and stepladders
- *INDG 403 – October 2005*
a tool Box Talk on Leaning Ladders & Stepladders
- *INDG 405 –October 2005*
Top Tips for Ladders & Stepladders

Further information on the use of ladders is available from:

British Ladder Manufacturers Association – (BLMA)
BLMA, PO Box 183 Leeds, LS11 1AG
www.ladders-blma.co.uk

Industrial Climbing Access Techniques (roped access)

Industrial access work, often referred to as roped access is generally considered for contracts where it is not reasonably practicable to use remote attachment devices or MEWPs, and where the working height exceeds **4.5m** making the use of ladders unsuitable ⁽³⁾.

Industrial climbing access techniques require technicians to work at height for the full duration of the rigging. Rigging of nets in this manner is time consuming, highly specialised and carries a degree of risk. Work must be carried out in accordance with *BS 7985:2002 Code of practice; Roped access for industrial purposes*. The current acceptable training standard accepted by the Major Contractors Group (MCG) is from the Industrial Roped Access Trade Association (IRATA). Due to the hazardous nature of roped access work it is vital that rigging companies ensure the riggers are competent to carry out this work ⁽⁴⁾.

During planning particular attention must be paid to the access and egress to the workface including hauling nets and attachment devices to the required positions. Early planning is essential to ensure that the risks are reduced as far as is reasonably practicable. This may for instance include ensuring that nets are laced together where it would be problematic for riggers to access the steel at mid points, and where possible ensuring that nets are attached in such a way that they can be released from above (providing a suitable attachment point exists).

During safety net rigging/de-rigging the operatives will most commonly use the technique of Aided access or Aiding, where the operative is attached directly to the structure by a minimum of two points of contact. The work method used can range from work positioning to a fall arrest, or a combination of the two.

BS 7985:2002 Code of Practice for Industrial purposes outlines the following principals for a safe and effective system:

1. Before roped access work commences, a hazard identification and risk assessment has to be carried out to establish the appropriateness of using specialised access techniques, and to address the hazard issues.
2. There should be a specific workmate rescue plan in place for each worksite.
3. Of primary importance is the principal of double protection- two points of contact. It is essential to include the provision of at least one alternative means of support to prevent an operative falling i.e. a working line plus a safety line, so that should one item fail there is adequate back up to prevent an accident. When an operative is to be in tension or suspension, there should be at least two independent anchor lines, one primary as a means of access, egress and support (the working line) and the other as an additional back up (the security line).

4. Connection to the rope system must be made from a safe area where there is no risk of a fall from height, unless protected by other means.
5. Exclusion zones should be established as appropriate.
6. All equipment should be appropriate for its application. It should be inspected before each use (Pre-use inspection) and more thoroughly at regular intervals. Details of thorough inspections should be recorded. Operatives should know when equipment should be withdrawn from service.
7. Operatives should work in teams of at least two.
8. Operatives should be trained and competent to carry out any roped access tasks that they are to undertake, including workmate rescue. Operatives should only be allocated tasks appropriate to their level of training.
9. Operatives should have clothing and equipment appropriate for the work situation and conditions.
10. An efficient means of communication should be in place and the team properly supervised at all times whilst in the workplace.
11. Supervisors should be competent in all roped access techniques appropriate to the workplace and should know and understand the limitations of those techniques.

Note

Equipment designed specifically for work restraint must not be used for work positioning or fall arrest. Where there is a possibility of a fall then a full body harness conforming to BS EN 361 must be used.

Sit harnesses should conform to BS EN 813, and should only be used for work positioning (including descending and ascending), and work restraint (i.e. travel restrictions).

For further information please refer to the following documents:

- *British Standard – BS 7985:2002*
Code of Practice for the use of roped access methods for industrial purposes
- *Industrial Rope Access Trade Association (IRATA)*
International guidelines — on the use of roped access methods for industrial purposes

General notes

- (1) International Powered Access Federation (IPAF)
Operators Safety Guide for Mobile Elevated Work Equipment.
- (2) In most circumstances it is not practicable to tie off a ladder to prevent it moving due to the speed of progression and ladders are often moved several hundred times a day during the rigging of safety nets. Ladders must always be footed during use where they are not tied off.
- (3) Circumstances may lead to ladder use as the best option above 4.5m however this will usually be for small one off areas only. A suitable and sufficient risk assessment should always be prepared outlining any additional control measures necessary.
- (4) Riggers must be suitably trained in both industrial access techniques and be trained in safety net rigging.
- (5) MEWPs must be inspected by a competent person at six monthly intervals. The machines are usually delivered along with a copy of the last inspection certificate, which remains with the machine, however this can often be misplaced and some hire companies therefore label the body of the MEWP with a sticker indicating last and/or next inspection date.