IRISH SAFETY AT HEIGHT ASSOCIATION

Safe Work at Height – Ladders

A Simple Guide for Clients and Designers

The guidance given in this document is intended as general advice based on present understandings of the Regulations, the 2005 Act and HSA's publications. While legal advice has been sought and taken into account in preparing the guide, the advice given should not be regarded as a legal interpretation of the Regulations or of the Act (No. 10 of 2005). Advice given here must be considered in the context of professional judgement being exercised by competent persons; it is not intended to provide the definitive approach in any situation. In all circumstances those best placed to decide on the appropriate action will be the parties undertaking the particular risk assessment and resulting control measures. Appropriate legal and insurance advice should be sought as necessary.

What is ISHA?

The Irish Safety at Height Association (ISHA) was formed by a number of companies, Skyway Safe Access Equipment, Brandon Agencies, Bruce Shaw Safety Management and Garland Safety Management with the aim of promoting safe work at height practices in Ireland.

Introduction

The purpose of this guide is to inform clients (i.e. building owners, facility managers, etc.) of the issues surrounding employees, suppliers or sub-contractors who will be working at height on buildings, with a particular focus on initial access to building roofs or high areas using temporary or fixed ladders. The guide also aims to outline the legislative duties placed on clients and those in control of the workplace with regard to working at height. Separate guides are available for other working at height topics, see www.workatheight.ie.

Why must we consider safety at height?

Since working at height is a dangerous activity there are moral and ethical reasons to do so. Over the past ten years a significant proportion of all construction related fatalities have been attributed to falls from height. Given the definition of construction is so broad this covers a vast array of activities being carried out by individuals at height in Ireland on a daily basis. Legislation is also in place that requires everyone involved in the design, construction and maintenance of a building to consider how falls from heights are prevented. The potential consequence of ignoring legislation and/or an operative getting injured, fatally or otherwise, is jail or a hefty fine and a loss of reputation as a minimum. Applicable legislation includes the Safety, Health and Welfare at Work Act 2005, Safety, Health and Welfare at Work (Construction) Regulations 2013 and the Safety, Health and Welfare at Work (General Applications) Regulations 2007. The Health and Safety Authority have also published a Code of Practice For Safety in Roof Works, which came into affect on the **1st of September 2011,** which imposes requirements on duty holders.

Summary

Portable and Permanently Fixed Ladders are basic methods of access from A to B and while using them you must have three points of contact at all times (i.e. one hand or foot off the ladder while moving and the other three must be on the ladder). Ladders are not a work platform but you are allowed to use portable ladders for short duration, low risk work in exceptional circumstances. The safe use of ladders is a source of much debate and controversy which is not made any easier by the fact that there are conflicting requirements set out in various European and British Standards, (see Appendix A at the end of this document for further information).

Where do I start?

The most basic requirement of Irish work at height legislation can be summarised in two words "**Risk Assessment**". You must consider the risks to your employees, third parties on your building, or others working in an area under your control. Upon consideration of the risks you must determine appropriate control measures to be applied and implemented for works at height. You may need help and advice with this process and this is readily available through competent and adequately resourced safety professionals.

Surely, I can pass on my responsibilities?

No – this is a common misconception. Section 15 of the 2005 Act places onerous duties on those in control of the workplace including the access and egress to the workplace. If you are the person in control of the building or work being undertaken, then ultimately the primary responsibility is yours. You are not able to sub-contract your legislative duties. However, employees and other third parties have a role to play as well. Contractor's etc, must have their own insurance, carry out their own Risk Assessment and produce Method Statements for the work. They must provide appropriate training to their direct employees.

SKYWAY Leaders in Safety at Height

Bruce Shaw The Construction People

BRANDON AGENCIES

GARLAND Concepts Realised

Can I simplify the Risk Assessment process?

Yes, there are some key steps that can be taken to ensure an appropriate and comprehensive risk assessment is undertaken and documented. The most fundamental question is to consider – ***"How often do I or someone under my control need to access my roof or other high area by temporary or fixed ladder?***

To answer the question you must first look at the type of access needs you have:

1. On a the basis of risk assessment, ladder access may be inadequate if accessing an area that has a high need for frequent access. For example this may be to a roof or plant area containing equipment that needs maintenance regularly. This will require different maintenance people accessing the plat area at different times throughout the year and they will have to transfer spare parts and tools to their work location. This would be at the high end of the scale on a Risk Assessment basis and you must consider a safer means of access than ladders – see panel below.

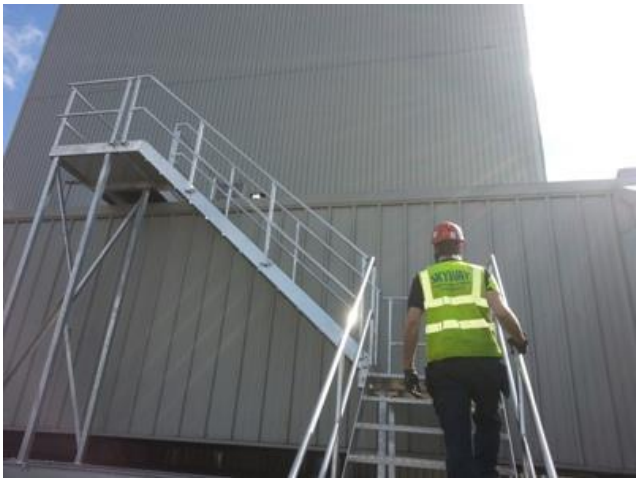
2. On the opposite end of the scale say you have a one storey roof with no plant, smoke vents or rooflights etc on it and the gutters are easily accessed by Mobile Elevated Work Platform (MEWP) or scaffold tower then you are probably better off not providing any ladder access. However, if there is a need to get onto the roof for any maintenance purposes then a temporary restrained ladder may be adequate. Using portable ladders over 4m is not recommended, therefore these types are applicable for one storey high only.

What do I do for a frequently accessed roof?

Okay, you have established that you need to do something to improve your safe access systems based on your initial Risk Assessment.

Once you have established that there will be a high potential frequency of access like in Item 1 above then standard fixed or portable ladders are not suitable.

You need to look at including a full stair system by continuing up an internal stair core to roof level, by providing an external stair system or providing a long access hatch in the roof with a full stairs underneath. This will give safe access for multiple users carrying various tools and/or spare parts to the roof.



Full Stair System

What do I do for a less frequently accessed roof?

To be conservative you should consider the safest form of access which is a full stair system as photographed above.

The next safest system is a ships ladder, photographed below, – i.e. a fixed ladder at about 75 degrees with small steps as opposed to rungs and it has small handrails. These are safer to use than fixed vertical ladders but are only useful to gain access one storey high.

Ships Ladder

A option of last resort would be to provide a fixed vertical ladder, photographed below, for access and provide a separate system for hoisting tools and spare parts – for example a davit arm or tripod and winch system. This is not very practical but might be the only solution in exceptional circumstances.

Fixed Vertical Ladder

If using this option, you must also make sure that operatives understand the risks while using such ladders and they must be physically fit and competent. Professional safety advice is a must when designing or using ladder access. Consideration must be given to regular inspections of temporary and fixed ladders to ensure they remain fit for purpose.

What design standards are available for fixed vertical ladders with safety hoops?

This is a good question an one which poses difficulty at present given conflicting information within current standards. See Appendix A for a comparative analysis of the dimensional requirements for each of the three current standards for hooped ladders, (BS5395-1, BS4211 and EN 14122). There is conflicting requirements between the three standards and best practice is to take the most conservative requirements from each standard – for example specify five vertical bars (BS4211) on the hoops as opposed to three (BS5395).

Is there a lot of confusion regarding the risks to operatives using vertical ladders with safety hoops?

Yes, most definitely. The Health and Safety Executive (HSE) in the UK commissioned a study in 2004 entitled **"Research Report 258: Preliminary investigation into the fall arresting effectiveness of ladder safety hoops."** The report ran to 223 pages and came to the conclusion that safety hoops are not effective in preventing falls from ladders. Furthermore, limbs becoming entangled in the hoop structure may prevent or slow the fall but the risk of severing the limbs (or indeed the head) is high.

The HSE undertook a further study in 2012 entitled **"Research Report 657: Hoop Ladders and the use of fall arrest systems"** where they looked at the effectiveness of adding vertical fall arrest systems (cables, tracks etc) to existing hoop ladders. They found that in most cases the addition of fall arrest systems to ladders provided a better level of protection to users. However it should be noted that some fall arrest systems did not work correctly on hoop ladders and the risk of injury to operatives was too high.

If considering vertical fall arrest systems on existing hoop ladders the HSE recommends that the manufacturer of the fall arrest system confirms that the proposed system is compatible with the hoop ladder. Also ask for proof that the vertical fall arrest system has passed what is known as a "**fall-back**" test.

The overall conclusion to both reports was that dutyholders must consider and understand the varying risks of using ladders with hoops and / or vertical fall arrest systems. They also say that there is a great need for further detailed research and testing on how best to prevent falls from ladders.

Temporary Ladder restrained in position

I am a designer, what should we as the design team do to minimise risk?

The most obvious answer is to eliminate temporary or fixed vertical ladders altogether and provide stair access.

If fixed vertical ladders are the only option and you have determines same by risk assessment, then ensure vertical fixed ladders you design comply with the standards in the Appendix A and consider using appropriate vertical fall arrest cables or tracks on the ladders to reduce the risk to users.

Note:
These systems require professional and specialist design as inadequate design could lead to the systems adding risk as opposed to reducing risk. For example if the cable or track does not extend up past the top of the ladder the operative may be put at risk while trying to detach from the system. Ideally the operative should pass through a spring loaded gate on the top platform before detaching from the vertical fall arrest system.

Again, watch out for vertical fall arrest systems that do not pass the **"fall-back"** test.

What if I am still not sure what is best?

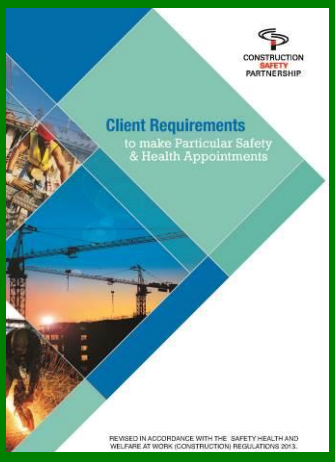
You should engage a competent and adequately resourced professional safety company or consultant to ensure you provide the most appropriate system available to prevent operatives from falling from height. You should ensure that designs prepared for you are by a competent professional. The design should include drawings and specifications backed up with the company's Professional Indemnity insurance.

Remember, if you end up in court the judge will ask whether you carried out a risk assessment and whether you provided "reasonable" protection to operatives working at height. You need the assurance of being able to answer yes to both questions.

Do I have any other duties?

The installation of ladders or new fall protection systems constitutes "Construction Work" as defined in the Safety, Health and Welfare at Work (Construction) Regulations 2013. You may therefore be required to appoint a competent and adequately resourced project supervisor for the design process (PSDP) and project supervisor for the construction stage (PSCS) for these works.

In fact, the work that is being undertaken on the building itself, such as roof repairs, plant maintenance or cleaning may require the appointment of project supervisors, PSDP and PSCS. A client assessment of requirements checklist is available from the Construction Safety Partnership (CSP) to determine if and when the appointments need to be made. This very useful tool can be used to determine the requirements for works being undertaken and also serves as documented evidence of checks being undertaken. This checklist is available here: http://www.csponline.ie/documents/FinalClientAssessment_001.pdf



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Appendix: A
Comparison of the Varying Dimensions of Ladders under Current Standards

Item or Description	BS5395-1: 2010	BS4211: 2008	EN 14122-1: 2010	Comments
Maximum Straight Run Height	6000	10000	10000	
Maximum Distance Between Rest Platforms	6000	6000	6000	
Climb Height without Hoops	2000	2000	2000	
Bottom Hoop Height Minimum	2500	2200	2200	
Bottom Hoop Height Maximum	2500	3000	3000	
Clear Distance Between Hoops Max	900	1500	1500	
Clear Distance Between Hoop Bars	n/a	300	300	
Number of Hoop Bars	3	5	5	
Hoop Diameter Range	700 to 760	650 to 800	650 to 800	
Minimum Distance from front of rung to wall	n/a	200	200	Can reduce to 150 for one off obstructions
Minimum Clear Distance from back of rung to wall	230	n/a	n/a	
Rung Spacing Range	225 to 255	225 to 300	225 to 300	
Rung Diameter	20 to 50	20 to 35	20 to 35	
Ladder Width Range	380 to 450	400 to 600	400 to 600	Can reduce the 400 to 300 if necessary
Maximum Gap at Top (Top Rung Level with Platform)	75	75	75	
Walk Through at Ladder Top	600 to 700	600 to 700	500 to 700	
Ladder Top Projection (Walk Through Type)	1100	1100	1100	
Ladder Top Projection where Ladder comes through a Platform	1100	1680	1680	
Protection where Ladder comes through a Platform	n/a	Trap door or handrails & gate	Trap door or handrails & gate	
Minimum Intermediate Platform Size	850 x 850	700 x 700	700 x 700	
Ladder Top Fall Prevention Measure, (through Stile type)	Chains or Gate	Full Gate Only	Full Gate Only	Gates must be self closing & have toe plate. They must swing in to platform and away from the ladder.
Guardrail each side of Ladder at the Top Platform	n/a	n/a	1500 wide each side	

The above table reflects current standards and the requirements of same as of September 2013. You should always check and consult the latest version of each standard for any chances prior to undertaking any design or construction works.