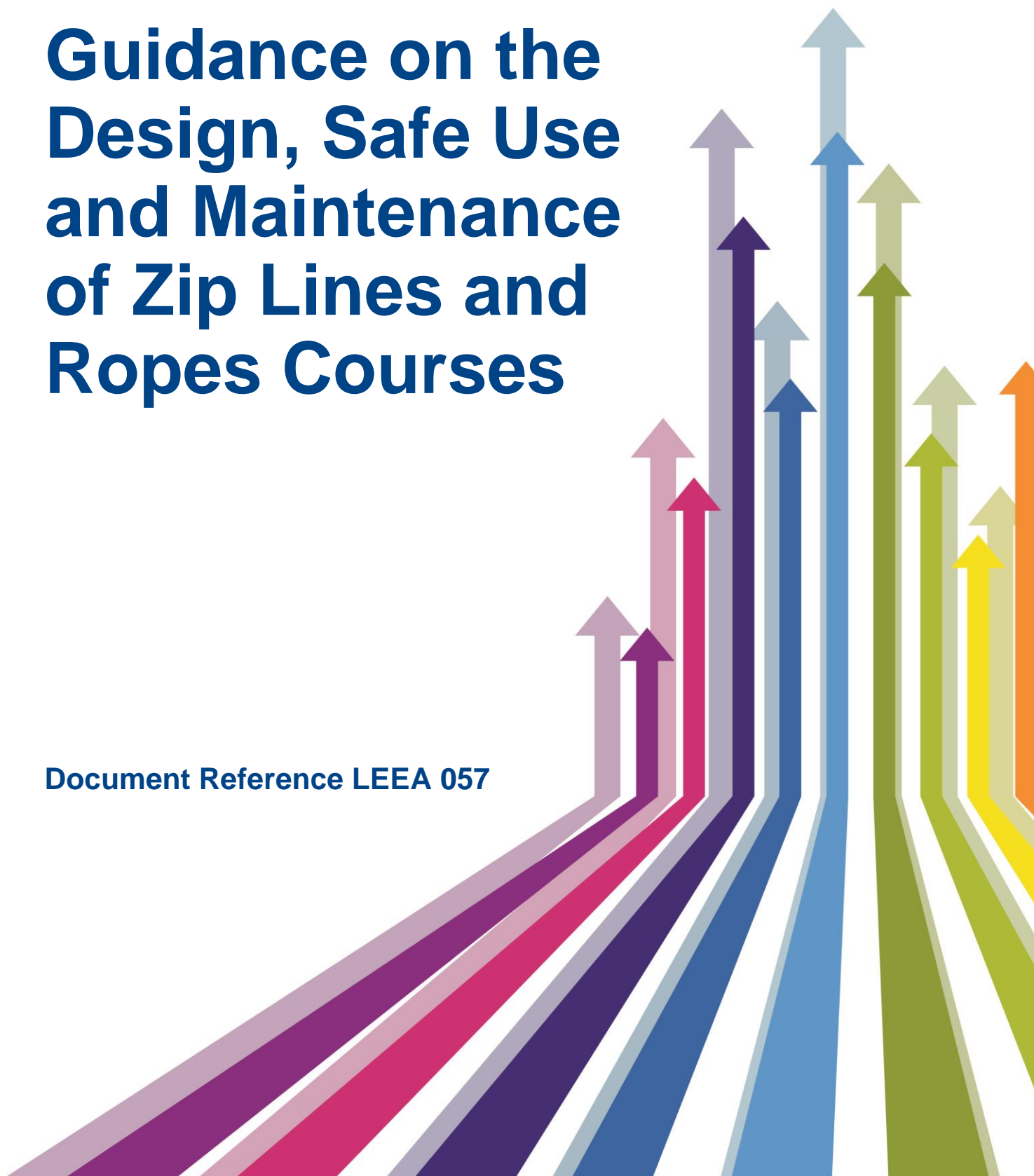


Guidance on the Design, Safe Use and Maintenance of Zip Lines and Ropes Courses

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**GUIDANCE ON THE DESIGN, SAFE USE AND MAINTENANCE OF ZIP LINES AND
ROPES COURSES**

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GUIDANCE ON THE DESIGN, SAFE USE AND MAINTENANCE OF ZIP LINES AND ROPES COURSES

Contents:

Introduction	Page 1
Terminology	Page 2
Summary of key legislation	Page 3
Summary of current standards	Page 5
Summary of other published guidance	Page 7
Summary of responsibilities	Page 8

INTRODUCTION

The terms 'Zip Lines' and 'Ropes Courses' cover a wide range of equipment which may be used for recreation, education, training or therapeutic purposes. They include equipment suitable for playgrounds as well as that for more challenging recreation. They provide the participants with thrills, excitement and challenges.

To use this equipment, the participant will be at some height from the ground and may travel at speed so there is the possibility of falls and collisions. Good equipment and appropriate supervision will control these risks and minimise any injuries.

There are several British and European standards for the design, installation and operation of this equipment. There are also some authoritative codes of practice and guidance on the subject. Last but not least, depending upon the situation, there is some legislation which may apply and place duties upon those who provide and operate such equipment.

The purpose of this guide is to bring all those sources of information together as an overview. It is intended as a starting point for anyone specifying, purchasing, supplying, manufacturing, installing, inspecting, maintaining or operating such equipment.

Good equipment and appropriate supervision will enable the thrills, excitement and challenges to be delivered safely.

TERMINOLOGY

Belay

Equipment to which the user is attached to limit the distance of, and/or prevent injury from, a fall.

Competent Person

A person having such practical and theoretical knowledge and experience of the equipment which is to be thoroughly examined that will enable him/her to detect defects or weaknesses which it is the purpose of the examination to discover and assess their importance to the safety of the equipment.

Guidance

Information usually issued by professional or trade bodies to assist in the interpretation and application of regulations, legislation, standards or ACoPs.

Legislation

Legally binding requirement, the scope of which is outlined in each document

PPE

Personal protective equipment, such as harness used by a single user in conjunction with a restraint or fall arrest system.

Ropes Courses

The EN standard defines this as a “constructed facility consisting of one or more activity system, support system and if needed belay and/or safety system”. A Ropes Course is distinct from playground equipment in that it has restricted access and requires supervision. A Ropes Course may also include a Zip Line.

Standard

National standard (BS), International Standard (ISO), European standard (EN), all of which reflect the technology of the day and whilst not mandatory, they act as a benchmark for industry best practice.

Zip Lines

Activity system in which the participant glides under gravity in a sloping direction. These can also be known as Zip Wires, Aerial Runways, Flying Foxes or Death Slides.

SUMMARY OF KEY LEGISLATION

Overview of legislation

There is very little legislation covering the specific operation and use of Zip Lines. Much of what there is applies to Ropes Courses generally. There is however health and safety legislation which applies in any work situation and places duties on employers, employees, manufacturers and suppliers.

Whilst such legislation does not apply to a person constructing a Zip Lines for their own use, in the event of an accident, such a person may be held responsible and sued for damages in a civil court.

In the event of a fatality, manslaughter charges may be brought against an individual or corporate manslaughter charges may be brought against a company.

The basis of United Kingdom Health and Safety Law is the Health and Safety at Work etc. Act 1974 (HASWA). HASWA specifies general duties for employers, employees, manufacturers, importers and suppliers. Regulations applicable to various operational or work situations are made under the provisions of HASWA. These regulations are enforceable by law.

The Management of Health and Safety at Work Regulations apply to employers and the self-employed in virtually all work situations with few exceptions.

Modern safety legislation is risk based and goal setting. This means that it states what you must achieve rather than how you must do it. It therefore gives those who have legal duties some freedom as to how they comply but also makes them responsible for ensuring that what they do is adequate.

Some regulations are accompanied by an Approved Code of Practice (ACoP). It gives practical advice on how to comply with the law. If you follow the advice you will be doing enough to comply with the law in respect of those specific matters on which the Code gives advice. You may use alternative methods to those set out in the code. However the Code has special legal status. If you are prosecuted for breach of health and safety law, and it is proved that you did not follow the relevant provisions of the Code, you will need to show that you have complied with the law in some other way or a court may find you at fault.

In some situations more than one set of regulations may apply. For example the Provision and Use of Work Equipment Regulations (PUWER) applies to all work equipment and the Lifting Operations and Lifting Equipment Regulations (LOLER) apply in addition for such operations and equipment.

Where regulations overlap, those which are most relevant to the context usually take precedence. For example, whilst both LOLER and the amended Work at Height Regulations (WAHR) apply to Ropes Course operations, WAHR may be considered more relevant and could be given precedence.

A number of general regulations may also be applicable to Zip Line operations such as The Manual Handling Operations Regulations 1992 and The Workplace (Health, Safety and Welfare) Regulations 1992.

Regulations relevant to the workplace

The Management of Health & Safety at Work Regulations 1999 as amended (MHSWR)

These place duties upon employers and providers which are relevant to both employees (instructors) and members of the public (participants). They require providers to have undertaken a suitable and sufficient risk assessment, made arrangements to implement

necessary measures, appointed competent people and arranged for appropriate information and training to be provided. The risks would need to extend to those waiting for their turn, those involved in the hauling or lowering of others, the return of the equipment to the launch point, getting down or up from the actual Zip Line and those involved in operating the Zip Line.

The Work at Height Regulations 2005 as amended (WAHR)

These regulations require that you avoid working at height where possible. In the context of some adventure activities being at height is intrinsic to the actual experience and in 2007 the regulations were amended to reflect this particular situation. In this context, WAHR puts emphasis on fall prevention even when action has been taken to reduce the consequences of a fall such as the provision of fall arrest systems.

The Provision and Use of Work Equipment Regulations 1998 (PUWER)

These regulations apply to equipment provided for use at work. As such they do not apply to equipment provided to participants but they are relevant to workers and the potential effect on the public of the equipment they use.

PUWER focuses on the provision of the correct tools or equipment for a particular job and ensuring that the equipment is suitably maintained taking account of the environment in which it is operated.

The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)

These regulations include equipment used to lift people, which includes mobile elevating work platforms (MEWPS often known as cherry pickers), cranes and winches. They place a duty on those responsible to ensure the equipment is sufficiently strong and stable enough to perform its intended application. It also requires that lifts are planned, supervised and that equipment is checked and maintained. As with all regulation, specific reference is made to the importance of appropriately competent individuals.

The Personal Protective Equipment Regulations 1992 (PPER)

These regulations require employers to provide protective clothing and equipment (PPE) for their employees. Equipment and clothing should be based on an assessment of hazards and the needs of individuals exposed to them. Training in the correct use of PPE is also specified in the regulations. Much of the equipment issued to participants of Zip Line activities would be considered as PPE if used in a workplace environment.

The Adventure Activities Licensing Regulations 2004 as amended

These regulations form the framework of the licensing scheme, the primary aim of which is to provide assurances that good safety management is being followed so that people can have the opportunity to experience exciting and stimulating outdoor activities whilst not being exposed to avoidable risks of death and disabling injury.

Ropes courses are currently outside of the scope of these regulations and as such providers of Zip Lines do not require a licence for this activity. The licensing service (AALS) does consider the safety management of non-licensable activities, as part of the provider's overall culture of safety, in reaching its decision to issue a license. As a result, providers who have Zip Lines, in addition to other licensed activities, may have the Zip Line actively sampled by an AALS inspector as part of the overall licensing process. Existing license holders who add Zip Lines to their range are not required to inform the licensing service.

There is very little legislation covering the specific operation and use of Zip Lines. Much of the regulation refers to Ropes Courses.

SUMMARY OF CURRENT STANDARDS

Overview of standards

British, European and International Standards generally do not have a formal legal status. They specify what is accepted as good practice taking account of the technology of the day. As such, complying with a standard not only provides a good level of safety but it also demonstrates a responsible attitude.

Some European standards, called harmonised standards, have a quasi-legal status. These are product standards published in support of European Directives. European Directives are the basis of many of the national regulations referred to above. The status of such standards is published in the European Journal and is stated within an Annex Z in the standard. If you comply with a harmonised European standard, you are deemed to comply with the legislation. Complying with a harmonised European standard is not mandatory but it does act as a benchmark by which alternative methods may be judged.

Standards relevant to Ropes Courses and Zip Lines

BS EN 15567-1: 2007 – Sports and recreational facilities – Ropes Courses – Part 1: construction and safety requirements

The Standard draws normative reference to many EN Standards including EN 13411–1 to 7 covering wire rope assemblies and terminations. Also ISO 4209 in regard to Cranes – wire rope care, maintenance, installation and examination.

This standard is currently being revised. The new edition is expected in February 2015.

BS EN 15567–2: 2007 - Sports and recreational facilities - Ropes courses - Part 2: Operation requirements

The Standard has been reviewed and amended in April 2014. The draft has been under review for the past 4 years and the latest version is representative of that approved in 2007. The new edition is expected in February 2015.

Compliance with this European Standard is not a legal requirement but can be referenced by health and safety authorities when considering how an operator has discharged their duties. The Standard considers the practicalities of Ropes Courses and includes Zip Line operation.

The revision includes a section on the developments in equipment and recognises the potential impact of different systems upon the need for participants' training and levels of supervision. The Standard also sets out minimum levels of supervision based upon participant age, individual safety systems in use and the various areas of the course.

BS EN 1176–1: 2008 – Playground Equipment and surfaces – General safety requirements and test methods

This part of BS EN 1176 specifies general safety requirements for public playground equipment and surfacing. Additional safety requirements for specific pieces of playground equipment are specified in subsequent parts of this standard. This part covers playground equipment for all children. It has been prepared with full recognition of the need for supervision of young children and of less able or less competent children.

The purpose of this standard is to ensure a proper level of safety when playing in, on or around play-ground equipment, and at the same time to promote activities and features known to benefit children because they provide valuable experiences that will enable them to cope with situations outside the playground.

This part standard is applicable to playground equipment intended for individual and collective use by children, but excluding adventure playgrounds. It is also applicable to equipment and units installed as children's playground equipment although they are not

manufactured as such, but excludes those items defined as toys in EN 71 and the Toys Safety Directive.

NOTE Adventure playgrounds are fenced, secured playgrounds, run and staffed in accordance with the widely accepted principles that encourage children's development and often use self-built equipment. This document specifies the requirements that will protect the child from hazards that he or she may be unable to foresee when using the equipment as intended, or in a manner that can be reasonably anticipated.

BS EN 1176-4: 2008 – Playground Equipment and surfaces – Additional specific safety and test methods for cableways

BS EN 1176-4 is applicable to cableways whereby children travel on or along a cable by the use of gravity. This standard specifies additional safety requirements for cableways intended for permanent installation for use by children.

BS EN 1176-7: 2008 – Playground equipment and surfaces – Guidance on installation, inspection, maintenance and operation

This part of BS EN 1176 gives guidance for the installation, inspection, maintenance and operation of playground equipment including ancillary items, e.g. gates, fences and surfacing.

OTHER PUBLISHED GUIDANCE

Safety Note, Zip Line and fan brake accident, Environment Health & HM Inspector of Health & Safety (Hosted by ADIPS) March 2012

This short report details an incident which occurred in September 2011. Produced by an Environmental Health Officer and HM Inspector of Health and Safety, the report has been made publicly available by the Amusement Device Inspection Procedure Scheme (ADIPS) via HSE safety notifications section of their website. It is possible this was a one-off as all other entries relate to more traditionally accepted examples of amusement rides and more recent Zip Line incidents have not appeared. Reference should be made to the ADIPS website.

The UK Ropes Course Guide, 3rd Edition. Adventure Activities Industry Advisory Committee (AAIAC) in conjunction with the European Ropes Course Association (ERCA), March 2011

The document is intended to assist all those involved with Ropes courses to enable them to comply with EN 15567:2007. It is largely a re-work of European Standards with reference to HASWA and WAHR in the UK context. It addresses construction, inspection, maintenance and operation. It is generally focused towards practical application and is freely available.

In relation to operation, the document provides definition for various roles of instructor, and operator as well as defining the three levels of supervision set out in the standard. Operational inspections are discussed, although not well explained.

The document sets out the required contents of a 'User Manual', operational documentation and the duties of constructors. In keeping with the standard it avoids stating ratios with the single exception of a maximum of 4 persons at height to each instructor in an assisted belay context. Issues relating to numbers of participants per element and off-element supervision are not made for the operation of self-belay courses some of which could be specifically applied to Zip Lines.

Reference should be made to the AAIAC website. A comprehensive revision is expected Autumn 2014.

Safety Alerts, The European Ropes Course Association

ERCA produces 'safety alerts' and forwards manufacturers recall notices with the aim of disseminating up to date information which it hopes may help to avoid repeat accidents on high Ropes Courses. Safety alerts are emailed to ERCA instructor members automatically and also include newsletters.

ERCA alerts make clear that they are not the result of an ERCA led in-depth accident investigation. These alerts are freely available via the ERCA website.

SUMMARY OF RESPONSIBILITIES

Designers and Specifiers

Those designing and/or specifying components for Zip Lines or Ropes Courses should ensure that any equipment or components are fit for purpose and suitable for the particular application, taking account of factors such as:

- Frequency of use
- Duration of use
- Environmental conditions
- Travel speed
- Potential weight loadings

Suppliers

Those supplying equipment for Zip Lines and/or Ropes Courses should seek assurance from the purchaser that the equipment has been properly specified, taking into account the relevant legislation, standards, guidance notes and any other relevant information available.

Those supplying equipment to clients who specifically request items which may be used as components of a Zip Lines or a Ropes Course should enquire as to the intended use in order to offer guidance where applicable.

Those operating Zip Lines or Ropes Courses should ensure that the equipment is inspected and maintained in a serviceable condition and that the operation is adequately supervised taking account of factors such as:

- Age of participant
- Size and weight of participant
- Previous experience and skill of participant on Zip Lines or Ropes Courses
- Conditions prevailing at the time of use

Inspectors

The organisation responsible for inspecting Zip Lines and Ropes Courses should ensure that the person carrying out the inspection has received adequate training and is competent for the purpose (Competent Person) taking account of the type and complexity of the installation.