AS 2316.1—2009

Australian Standard®

Artificial climbing structures and challenge courses

Part 1: Fixed and mobile artificial climbing and abseiling walls

This Australian Standard® was prepared by Committee SF-047, Artificial Climbing Structures.
It was approved on behalf of the Council of Standards Australia on 20 October 2009.
This Standard was published on 28 November 2009.

The following are represented on Committee SF-047:

- Association for Challenge Course Technology Australia
- Australian Amusement Association
- Australian Camps Association
- Christian Camping International Australia
- Engineers Australia
- Indoor Rockclimbing Gyms of Australia Association
- Outdoor Council of Australia
- Scouts Australia
- Sport Climbing Australia
- WorkSafe Victoria

This Standard was issued in draft form for comment as DR 08324.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

Keeping Standards up-to-date

Australian Standards® are living documents that reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued.

Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments that may have been published since the Standard was published.

Detailed information about Australian Standards, drafts, amendments and new projects can be found by visiting **www.standards.org.au**

Standards Australia welcomes suggestions for improvements, and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.org.au, or write to Standards Australia, GPO Box 476, Sydney, NSW 2001.

Australian Standard®

Artificial climbing structures and challenge courses

Part 1: Fixed and mobile artificial climbing and abseiling walls

First published as AS 2316.1—2009.

Published by Standards Australia GPO Box 476, Sydney, NSW 2001, Australia

ISBN 0 7337 9313 4

PREFACE

This Standard was prepared by Committee SF-047, Artificial Climbing Structures.

The objective of this Standard is to provide designers, manufacturers, proprietors and operating personnel with requirements and guidance specific to the design, construction, operation and maintenance of artificial climbing walls used for climbing, bouldering and abseiling in order to maximize the protection of health and safety for both operating personnel and participants.

In general, the performance requirements of this Standard are based on EN 12572-1:2007, *Artificial climbing structures*—Part 1: *Safety requirements and test methods for ACS with protection points* and prEN 12572-3:2007, *Artificial climbing structures*—Part 3: *Safety requirements and test methods for climbing holds*. Changes have been made to reflect different terminology used in Australia and to address artificial climbing structures used for a wide range of climbing, abseiling and bouldering activities.

The Committee also acknowledge the assistance provided by the following publications during preparation of this Standard:

Health and safety for artificial climbing structures and operations, WorkCover NSW, 2002.

Adventure Activity Standards, Artificial Climbing Structures (ACS), Outdoor Recreation Centre, Edition 1 (April 2003).

Adventure Activity Standards, Abseiling, Outdoor Recreation Centre, Edition 2 (April 2005).

This Standard is the first of a proposed series on artificial climbing structures and challenge courses. The Committee has identified other possible topics such as flying foxes and various components of high ropes courses.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

CONTENTS

Page

Page

APPENDICES

FOREWORD

This Standard is concerned with the design, construction, testing and operation of artificial climbing and abseiling walls. Artificial climbing and abseiling walls originated from the desire to simulate the climbing and belaying challenges encountered in the recreational pursuit of rock climbing in a manner accessible to the general public. Climbing and abseiling solely on artificial walls is now considered to be a recreational pursuit in its own right, as well as being recognized internationally as a sport and as a valuable training or learning tool by education institutions and employers.

Climbing and abseiling, for many participants, introduces stressors (e.g. height) to increase perceived and real personal risk, forcing people and teams outside their 'comfort zone' in order to maximize the recreational experience to develop their maximum potential. These challenges can be pivotal tools for training or learning outcomes such as developing self-confidence, trust, honesty, teamwork, responsibility, humility, fear management and loyalty.

Artificial climbing and abseiling walls can provide a training and recreational activity that, when compared to a similar activity in a natural setting (i.e. bushland) provides—

(a) a more cost effective option;

(b) a more controlled environment with more predictable hazards and risks;

(c) local, easier and more frequent access, reducing transport costs;

(d) on-site logistic and medical support;

(e) a less abrasive environment to consumable equipment, maximizing the serviceable life of equipment;

(f) flexibility of training and learning outcomes;

(g) tailored learning simulations for workplace exercises such as team-building and corporate training; and

(h) reduced environmental damage.

Use of an artificial climbing wall involves two activities—climbing and belaying. Climbing is the act of an individual under his or her own power, ascending or traversing an essentially vertical or near vertical surface by holding or standing on natural or installed surface projections, inserts or aids. Belaying can be defined as affording a safeguard to a moving climber.

A belay system is used to protect a falling climber from a high velocity impact with the ground or another structure. Typically, this relies on a belayer managing a belay rope and belay device during the climber's progress. Other non-manned methods of belay (protection) can also be utilized, namely automatic mechanical belay systems.

The risk associated with climbing without a means of protection (belay) is considered to be unacceptable, except for where the climber is said to be bouldering, i.e. in circumstances where the climber remains close to the ground and climbs without a belay rope but impact attenuating surfaces, spotters or both act as the protection system.

In an artificial setting, climbers typically support themselves during progress along the climbing route by using handholds and footholds. The holds may be integral to the structure or may be removable. Commonly, removable holds are used to allow changes to the nature and difficulty of the climbing route.

Abseiling is an act of self-descent on a fixed rope (as opposed to being lowered by a belayer). Abseilers may have limited contact with the wall during the descent.

This Standard acknowledges that many types of belay systems exist now and others are likely to be devised in the future. It is not the purpose of this Standard to specify which systems should or should not be used, but rather to define the minimum requirements of such systems.

The climber's and abseiler's reliance on themselves or another to be competent at belaying and the belayer's responsibility to be competent, is recognized by the industry to be an essential and expected component to climbing and abseiling.

Climbing is not just about getting to the top of the wall. Much of climbing's attraction can be attributed to the associated commitment elements, such as trust and responsibility.

This Standard has been developed to ensure that participants are informed of and understand the real risks, that all belayers are competent and that all associated infrastructure and equipment meets nominated criteria. Adherence to this Standard should limit any harm to those involved in incidents that are associated with human error and prevent incidents associated with equipment of structure failure, i.e. provide a safe environment to pursue the activities of climbing or abseiling.

The choice by an operator to either use or not use a belay system that will 'fail safe' in the instance of belayer error should be made on the basis of the results of a risk assessment and an examination of the rationale for owning, operating or using the climbing or abseiling wall.

Top-rope climbing and lead climbing employ the two common belay systems. Having the end of a belay rope secured to the climber's harness and having the other end rigged in a belay device which is managed correctly are critical skills common to both systems.

In top-rope climbing, the belay rope goes from the climber up to the top of the climb, is redirected over a top anchor (belay block) before being managed by the belayer.

In lead climbing, the climber locates the rope through a series of anchors during progression on the wall. The lead anchors act as intermittent top anchors in the event of a fall and during climber support or lowering.

It is intended that the climber is neither hindered nor aided by the rope. The role of the belay rope is to—

(i) prevent or arrest a fall;

(ii) support the climber during a rest; and

(iii) provide a controlled means of egress from height at completion of the climb attempt.

STANDARDS AUSTRALIA

Australian Standard
Artificial climbing structures and challenge courses

Part 1: Fixed and mobile artificial climbing and abseiling walls

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies the minimum requirements for the design, construction, operation, competencies for support personnel, supervision levels, maintenance and testing of fixed and mobile artificial climbing and abseiling walls (ACW) and associated components. It includes fixed, indoor, outdoor, permanent, temporary and mobile structures (including inflatable climbing structures) and facilities used for climbing, abseiling and bouldering.

This Standard is not applicable to playground equipment (see AS 4685) or structures associated with bungy jumping activities (see AS/NZS 5848) or theatrical and stunt work.

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS
1138 Thimbles for wire rope

1170 Structural design actions
1170.4 Part 4: Earthquake actions in Australia

1353 Flat synthetic-webbing slings (series)
1353.1 Part 1: Product specification

1657 Fixed platforms, walkways, stairways and ladders—Design, construction and installation

1720 Timber structures (series)

2076 Wire-rope grips for non-lifting applications

2318 Swivels for lifting applications

2319 Rigging screws and turnbuckles

2321 Short-link chain for lifting purposes

2741 Shackles

3533 Amusement rides and devices
3533.1 Part 1: Design and construction
3533.2 Part 2: Operation and maintenance
3533.4.1 Part 4.1: Specific requirements—Land-borne inflatable devices

3569 Steel wire ropes

3600 Concrete structures

4100 Steel structures

4142 Fibre ropes