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STANDARDS Australia

Artificial climbing structures and challenge courses

Part 1.1: Safety requirements and test methods for belayed climbing and abseiling structures

AS 2316.1.1:2021

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Australian Amusement Leisure and Recreation Association
Australian Camps Association
Boulder Gyms Australia
Christian Venues Association
Engineers Australia
Indoor Climbing Industry Australia
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Scouts Australia
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Preface

This Standard was prepared by the Standards Australia Committee SF-047, Artificial Climbing Structures to supersede in part AS 2316.1—2009, *Artificial climbing structures and challenge courses, Part 1: Fixed and mobile artificial climbing and abseiling walls*.

The objective of this document is to provide designers, manufacturers, proprietors and operators with requirements and guidance specific to the design, construction, operation and maintenance of artificial climbing structures used for climbing and abseiling in order to maximize the protection of health and safety for both operators and users.

This document forms part of the AS 2316.1 series. The series will consist of the following three Parts:

AS 2316.1.1, *Artificial climbing structures and challenge courses, Part 1.1: Safety requirements and test methods for belayed artificial climbing and abseiling structures* (this document)

AS 2316.1.2, *Artificial climbing structures and challenge courses, Part 1.2: Safety requirements and test methods for bouldering structures*

AS 2316.1.3, *Artificial climbing structures and challenge courses, Part 1.3: Safety requirements and test methods for climbing holds*

The document acknowledges that in a variety of environments, residential/recreational camps, climbing gyms and schools, artificial climbing structures (ACSs) have a significant percentage of clients that bring their own equipment to perform the activities which requires maintenance and appropriate storage. Where this occurs, it introduces risk that is a shared responsibility for both the user and operator.

The terms “normative” and “informative” are used in Standards to define the application of the appendices 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

Introduction

This document is concerned with the design, construction, testing and operation of artificial climbing and abseiling structures. Artificial climbing and abseiling structures 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 structures 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 users, introduces stressors (e.g. height) to increase perceived and real personal risk, enabling people and teams to perform 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. Climbing is not just about getting to the top of the structure. Much of climbing's attraction can be attributed to the associated commitment elements, such as trust and responsibility.

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

(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 structure involves three activities — climbing, belaying and abseiling.

Climbing is the act of an individual, progressing (upwards, downwards or sideways) with or without assistance across the surface by holding or standing on natural or installed surface projections, indents or aids.

Belaying can be defined as affording a safeguard to a moving climber. A belay system is used to protect a falling or descending 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 methods of belay (protection) such as automatic belay systems can also be used.

Abseiling is an act of self-descent on a fixed rope (as opposed to being lowered by a belayer).

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 (refer to AS 2316.1.2, *Artificial climbing structures and challenge courses, Part 1.2: Safety requirements and test methods for bouldering structures*).

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 (refer to AS 2316.1.3, *Artificial climbing structures and challenge courses, Part 1.3: Safety requirements and test methods for climbing holds*).

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

Adequate and appropriate maintenance of facilities should be performed in a timely manner.

This document has been developed to ensure that all associated infrastructure and equipment meets nominated criteria.

Adherence to this document should limit 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 safer environment to pursue the activities of climbing, belaying or abseiling.

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Section 1 Scope and general

1.1 Scope

1.1.1 General

This document specifies the minimum requirements for the design, construction, operation, supervision levels, maintenance and testing of belayed artificial climbing structures (ACS) and abseiling structures and associated components.

1.1.2 Inclusions

This document includes indoor and outdoor structures and facilities used for climbing and abseiling.

1.1.3 Exclusions

This document excludes the following:

(a) Bouldering (refer to AS 2316.1.2).

(b) Climbing holds (refer to AS 2316.1.3).

(c) Natural surfaces with artificial holds and/or belay points.

(d) Playground equipment (refer to AS 4685).

(e) Structures associated with bungy jumping activities (refer to AS/NZS 5848).

(f) Theatrical and stunt work.

(g) Mobile artificial climbing structures [refer to AS 3533 (series)].

(h) Inflatable climbing structures.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

NOTE Documents for informative purposes are listed in the Bibliography.

AS 1138, *Thimbles for wire rope*

AS 1170.4, *Structural design actions, Part 4: Earthquake actions in Australia*

AS 1353.1, *Flat synthetic-webbing slings, Part 1: Product specification*

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

AS 2076, *Wire-rope grips for non-lifting applications*

AS 2316.2.1, *Artificial climbing structures and challenge courses, Part 2.1: Flying foxes and challenge ropes courses — Construction and safety requirements (EN 15567-1:2007, MOD)*