



Elevating and Amusement Devices Safety Program	Ref. No.: 536 / 17
ADVISORY	Date: December 6, 2017

Subject: Zip Line Harness Requirements

Distribution: TSSA website - Amusement Devices Advisory Council – Zip Line Operators

1. Advisory Overview

This advisory is intended to inform about

- a) Upcoming changes to zipline harness requirements in the proposed Amusement Device Code Adoption Document Amendment, and
- b) the implications to zip line owners, who are operating under a variance to the requirements set forth in CAD Amendment 534-12 requirement 7.13.2

2. Current Harness Requirements of CAD 534-12

CAD Amendment 534-12 section 7.13 dealing with harnesses requires the following;

- 7.13.1 *Harnesses shall be commercial grade, designed and manufactured for zip lines, paragliding, or mountaineering and shall bear the label of one of the following:*
- (a) EN 12277: 2007 "Mountaineering equipment – Harnesses – Safety requirements and test methods",
 - (b) EN 1651: 1999 "Paragliding equipment – Harnesses – Safety requirements and strength tests" or
 - (c) UIAA 105 "Mountaineering and Climbing Equipment Harnesses".
- 7.13.2 **Where sit harnesses or similar are used, a certified chest harness shall also be utilized. The chest and seat harness shall be used in such a manner so as to prevent inversion, whether deliberate, accidental or in the event of loss of consciousness.**
- 7.13.3 *Harnesses shall be available to fit the range of participant sizes permitted on the zip line.*
- 7.13.4 *Harness selection shall consider the time required for evacuation.*
- 7.13.5 *Harness construction, design and fit must be adequate to keep the participant attached at all times and in the proper orientation.*

The requirements of 7.13.2 were written so that the combination of sit and chest harness or a full body harness shall be used to prevent inversion whether deliberate, accidental or in the event of loss of consciousness.

In the early stages of the adoption of zip line requirements, some zip line operators were granted a variance to operate using a sit harness only (no sit and chest harness combo, or no full body harness) after citing foreseen difficulties in traversing obstacles with a type of rigging that had a high connection point relative to a person's torso. Each variance application was reviewed on a case-by-case basis and was site-specific.

3. New Harness Requirements Proposed in CAD 535-18

The Amusement Devices Code Adoption Document Amendment 535-18 proposes to adopt a series of ASTM-F24 Committee standards to replace the existing requirements of Z267 Safety Code for Amusement Devices and update the corresponding requirements of CAD 534-12 accordingly. In the process, Part 7 which supplements Zip line requirements will be updated.

With respect to harnesses the proposed requirements are as follows:

7.10.9 *Harnesses shall;*

- (a) *be available to fit the range of participant sizes permitted on the zip line,*
- (b) ***offer full body harness protection, either as a full body harness or as a combination sit and chest harness arrangement to ensure patron is retained regardless of rider orientation.***

Note: The following standards are accepted for equipment identification as required above. Other standards may be used if acceptable to the director.

*UIAA 104 Mountaineering and Climbing Equipment 'Slings'
UIAA 105 Mountaineering and Climbing Equipment 'Harnesses'
UIAA 121 Mountaineering and Climbing Equipment 'Connectors/Karabiners'
UIAA 106 Mountaineering and Climbing Equipment "Helmets"*

*EN 566:2006 Mountaineering equipment. Slings. Safety requirements and test methods.
EN 12277: 2015 Mountaineering equipment. Harnesses. Safety requirements and test methods.
EN 12275:2013 Mountaineering equipment. Connectors. Safety requirements and test methods.
EN 361:2002 Personal protective equipment against falls from a height. Full body harnesses.
EN 362:2004 Personal protective equipment against falls from a height. Connectors.
EN 1651:1999 Paragliding equipment. Harnesses. Safety requirements and strength tests.
EN 12492:2012 Mountaineering Equipment. Helmets for mountaineers. Safety requirements and test methods.*

*ANSI Z359 Fall Protection Code Version 3.0
CSA Z259.10-12 (R22016) Full body harness
ASTM F1772-12 Standard Specification for Harnesses for Rescue, Safety, and Sport Activities*

*UIAA refers to Union International Alpinism Association
EN refers to European Norm
ANSI refers to American National Standards Institute*

4. Sunset Date to Existing Harness Variances

The new proposed requirement of 7.10.9 (CAD 535-18) retains the intent of the original requirement 7.13.2 (CAD 534-12) to have a full body harness or equivalent sit and chest harness combination.

With the growth in the challenge course and zip line attractions, equipment updates now make it more possible to attach safety rigging to a combination of sit and chest harnesses or full body harnesses in a manner that does not adversely affect the ability of user to traverse a challenge course.

Under the goal of public safety for all Ontarians, TSSA recognizes a safety gap associated with falling out of an improperly fitted sit harness, and believes this risk can be better mitigated with a properly fitted full body harness or a combination of sit and chest harness. As a result, TSSA will no longer grant variances to the current AD CAD requirement 7.13.2 (CAD 534-12), and will begin enforcing compliance to the updated requirements for 7.10.9 (CAD 535-18).

Going forward;

- new installations for ziplines will be required to fully comply with the 7.10.9 of proposed CAD 535-18
- existing variances to AD CAD requirements 7.13.2 (CAD 534-12) will be expired by December 31, 2018

Consequently, by January of 2019 all ziplines in Ontario shall be operated with a full body harness or with a combination of sit and chest harness.

New harness configurations on a given zipline shall be submitted to TSSA as an alteration submission (dossier amendment).