

DEPARTMENT OF EMPLOYMENT AND LABOUR**NO. R. 1399****24 DECEMBER 2020****INCORPORATION OF HEALTH AND SAFETY STANDARD IN TERMS OF SECTION
44(1) OF OCCUPATIONAL HEALTH AND SAFETY ACT, 1993
DRIVEN MACHINERY REGULATIONS 17**

I Tibor Szana, appointed as Chief Inspector in terms of section 27(1) of the Occupational Health and Safety Act 1993, acting in terms of the powers vested in me by regulation 17 of the Driven Machinery Regulation 2015, after consultation with the Advisory Council for Occupational Health and Safety hereby incorporate a Code of Practice for commercial Zip line and Aerial Adventure Parks.

Users of all commercial Ziplines and Aerial Adventure Parks installed prior to incorporation of this code of practice are given 12 months to apply for permission to use. Users of existing installations are only expected to submit a certificate signed by a registered professional engineer or a technologist.

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T Szana
Chief Inspector

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CODE OF PRACTICE

The installation and operation of commercial Ziplines and Aerial Adventure Parks

1. Introduction

The requirements stipulated in this code of practice are intended solely to ensure safety in the installation and operation of Ziplines and Aerial Adventure Parks

The attention of users of this Code of Practice is drawn to the relevant regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

Definitions

'Aerial Adventure Park' means an adventure activity conducted at height above the ground where participants are attached to a self belay system.

'Anchorages' means a secure point of attachment for a lifeline or lanyard

'Arborist' means a professional in the practice of the cultivation, management, and study of individual trees

'Belay' means securing a rope (a running rope) round a cleat, rock, pin, or other object, to secure it.

'Braking device' means a solid object placed on the cable that is connected to an active braking system such as a belay device, gravity stop, bungee cord, or manual rope control such that the braking device is able to decelerate the incoming client and bring them to a safe stop at the landing point

certified equipment means equipment that has been certified to an applicable standard (Conformite Europeenne (CE), SANS, etc.).

'Code of practice' means a set of written rules which explains how people working in the Zipline and Aerial Adventure Park industry should behave.

'Commercial Zipline' means a Zipline in which the person is required to pay the owner for use thereof.

'Competent person' means a person who has in respect of the work or task to be performed, the required knowledge, training and experience and, where applicable, qualifications, specific to that work or task

'Carabiners' means a specialized type of shackle, a metal loop with a spring-loaded gate used to quickly and reversibly connect components, most notably in safety-critical systems.

'Lifeline/safety cable/belay system' means an overhead safety system designed to prevent a participant from falling off the Aerial Adventure Park.

'Lifeline' means as the safety line used to support persons while moving along elevated obstacles (climbing bridges, nets, etc).

'Mast' means tall structures designed to support a zipline

'Rope' means several strands of metal wire twisted into a helix forming a composite "wire rope", in a pattern known as "laid wire rope".

'Rope splicing' means the forming of a semi-permanent joint between two ropes or two parts of the same rope by partly untwisting and then interweaving their strands.

‘Shock load’ means a sudden and drastic increase of load.

‘Swaged fittings’ means wire rope components other than swage or stop sleeves, that are attached to the wire by compressing, (swaging) the fitting on to the wire

‘Tensioning device’ means a device that applies a force to create or maintain tension on a rope.

‘Wirerope clamp’ means clamps used to keep wire rope or cable in place

‘Zipline’ means a cable fixed between two points used for the transportation of people.

2. Scope

This Code of Practice covers the general safety aspects, construction, operation and maintenance of commercial Ziplines or and Commercial Aerial Adventure Parks that may be accessed by the public. This code of practice is not meant to cover non-commercial or private ziplines and private aerial adventure parks that is where the person is not required to pay the owner for use of the Zipline and Aerial Adventure Parks.

3. Permission to operate

(1) Any person who wishes to operate a Ziplines or Aerial Adventure Parks shall apply in writing to the Chief Inspector of the Department of Employment and Labour for permission for such use and shall, together with such application, submit—

- (a) a complete set of design calculations and drawings of the proposed installation; and
- (b) a certificate issued by a registered professional engineer or a technologist and where applicable an inspection report issued by an arborist in which they certify that they has checked the design of the installation and that such design will ensure the safe operation of the installation under all permitted loadings.

(2) Users of Ziplines or Aerial Adventure Parks installed prior to the incorporation of this code of practice must submit a certificate issued by a registered professional engineer or a technologist

(3) The user shall cause the entire installation and all working parts of every Zipline or commercial Aerial Adventure Park to be subjected to a thorough, documented examination and a performance test, by a competent person, at intervals not exceeding 12 months.

4. Design and construction

4.1 The design of Ziplines and Aerial Adventure Parks shall conform to acceptable good practice within the industry.

Due consideration shall be made for the following:

- a.) The location's suitability for this type of activity.
- b.) The nature of the ground on which foundations are to be built and slides are to cross;
- c.) The foundations for masts, platform, anchorages and tension adjustor must be able to accommodate all conditions of loading, including the wind loadings and other required safety factors.
- d.) The forces applied to the rope with rope loaded, shock-loaded and unloaded
- e.) Forces applied to rope terminations with rope loaded, shock-loaded and unloaded
- f.) Forces applied to anchors and structures with rope loaded, shock-loaded and unloaded
- g.) the mass of each component part

4.2

The design engineer must refer to all relevant standards for all materials used in the design and construction of the structure.

5. Erection

The erection of all installations shall be carried out under the supervision of a competent person.

6. Requirements for Steel wire rope

6.1.1 Suitability

Any rope used in the operation of commercial Ziplines and an Aerial Adventure Park shall be made of steel wire with diameter of no less than 10mm and be accompanied by a rope certificate.

6.1.2 New Rope

A rope test certificate must be obtained from the manufacturer showing the ultimate breaking force in relation to a new rope supplied and must meet requirements of the design specification.

6.1.3 Used Rope

A rope which has been previously in use shall not be installed unless it is certified by a competent person.

7. Design Factors

7.1 Breaking load to maximum working load ratios

The ratio of the breaking load to maximum working load of ropes shall be at least equal to 5:1.

7.2 Rope joints, terminations and fittings

7.2.1 Rope Splices

The length of a splice in a rope shall be at least 1 200 times the diameter of the rope and the clear distance between successive splices shall be at least 3 000 times the diameter of the rope.

7.2.2 Swaged Fittings

Swaged fittings are preferred for the finishing of rope ends, but when ropes are so fitted the strength of the rope for calculation purposes shall be reduced by 10 %.

7.2.3 Wire rope Clamps

7.2.3.1 Clamps shall:

- (a) be made of the Crosby or Bulldog pattern and shall comply with the requirements of SANS 813
- (b) be of the correct size for the rope on which they are used or
- (c) be of the U-bolt shall be fitted on the portion of rope that does not take the load and Nuts on the U-bolt should be tightened by the use of a torque equal to the appropriate test torque given in table 1 of SANS 813.
- (d) The clamps used shall be at least the appropriate number prescribed in table 1 of SANS 813.

7.2.3.2 When ropes are fitted to clamps, the strength of the rope for calculation purposes shall be reduced by 20 %.

8. Trees as Anchors on Ziplines and aerial adventure parks

8.1 Should trees be used as anchor attachment points for Ziplines and an Aerial Adventure Parks, or to support platforms, they are to be inspected and approved fit for purpose by a competent person every six months.

8.2 Regular inspections at six monthly intervals are to be carried out on such trees to ensure it remains healthy and structurally sound.

8.3 An arborist must inspect such installations every twelve months.

9. Safety Equipment

All safety equipment used to secure and transport people shall be certified by a manufacturer that such equipment is fit for the purpose it is being used for. All custom made safety equipment shall be tested and certified by Professional engineer.

Harnesses must be of the sit/waist or full body harness type.

Chest harnesses are only to be used together and in conjunction with a waist harness as an additional means of ensuring that a person remains in an upright position.

The use of safety helmets and other Personal Protective Equipment shall be used when required to do so, based on a site specific risk assessment.

10. Operation

10.1 Cable attachment

10.1.1 When moving along the Zipline or Aerial Adventure Park, people shall at all times to be connected between harness and pulley/trolley/cable.

10.1.2 Such connections are only to be made with correct safety rated equipment as described in clause 7.2.3 above, and through the use of locking carabiners.

10.2 Communication

A clear and adequate form of communication is to be employed between the operators and or competent individual (briefed individual) at the start and end of each slide to ensure the safe and controlled transfer of people along each cable.

10.3 Braking Device

In the case of Zipline that approaches the landing station at a speed of more than 10km/hr a suitable braking device is to be put in place to reduce the risk of impact injuries to persons.

10.4 Operators

10.4.1 All operators involved with the operation of the activities related to Ziplines and Aerial Adventure Parks must receive competent training from a suitably experienced competent person.

10.4.2 Upon completion of the operator training and relevant supervised practical experience on the activity, trainee operators shall be assessed as competent by a competent person before they are permitted to operate the equipment and take responsibility for client's safety on the activity.

11. Performance Testing

All new Ziplines and an Aerial Adventure Parks shall be load tested with 120% of the maximum working load before it is put in use for the first time and thereafter at intervals not exceeding 12 months or after modification or cable replacement, by a competent person.

Where Zipline and Aerial Adventure Parks are attached to trees, performance tests must be carried out every 6 months by a competent person.

12. Training and Maintenance

12.1 General

All persons involved with the maintenance of Ziplines and Aerial Adventure Park should receive training and ensure that they are fully competent to maintain the equipment concerned.

12.2 Operations manual

The manufacturer or supplier shall provide at least one copy of an instruction manual that contains at least the following information:

- a) A description of the installation, detailing its maximum working load, operating speeds, and safety devices;
- b) detailed operating instructions;
- c) information on maintenance measures (preferably accompanied by a schedule); and
- d) emergency procedures to be followed in the event of an incident or accident.

13. Records

13.1 A register or log book shall be kept on site in which the following information is recorded:

- a) name and address of the person in charge of the installation and the name(s) and address(es) of his deputy/deputies;
- b) rope certificate issued by the manufacturer or supplier
- c) dates of periodic inspections, a report on each inspection, and the signature of the person carrying out the inspection;
- d) details of stoppages, other than shut-downs, giving dates, times, reason for stoppages, and action taken;
- e) dates and details of periodic tests carried out and adjustments made, and the signature of the person carrying out each test.
- f) dates and details of the daily visual inspection reports
- g) dates and details of maintenance work carried out and adjustments made, and the signature of the person carrying out such work.

13.2 The owner/user shall ensure that at least one copy of an operations manual is available on site for inspection.

14. Safety Briefing

The operator shall provide a clear and concise safety briefing to all occupants before Zipline or Aerial Adventure Park activity is proceeded with. The safety briefing is to ensure that the occupants are aware of the duration, procedures, requirements, equipment and dangers associated with the said activity.