

Australian/New Zealand Standard™

Code of practice for bungy jumping



Standards Australia



AS/NZS 5848:2000

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Code of practice for bungy jumping

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PREFACE

This Standard is issued as a joint Standard under the terms of the Active Co-operation Agreement between Standards Australia and Standards New Zealand. It has been extensively modified since it was first released in 1992. Modifications include a more practicable testing regime for bungee cords and attachments, and also changes to reflect experience gained by operators over the last 7 years.

Where appropriate, dual clauses are used. These clauses commencing with either the words, “In New Zealand:” or, “In Australia:”, indicate requirements deemed necessary for one country only.

Bungee jumping is a new form of recreation. In 1989, and the beginning of 1990, three incidents occurred in New Zealand when bungee jumping resulted in serious injury. The risk of injury to themselves and to the public was recognized by the operators. Through the New Zealand Bungee Jumping Federation they requested that a Code of Practice be developed with the objective and purpose of controlling the risks, and to ensure the safety of the public and operators.

It is accepted within our present society that opportunities for people to experience a thrilling activity are provided. Where there is a potential for injury or death, then control of the risk is essential. This Code provides the standards on which to base the management of the inherent risks. The Code itself will not control the risks involved. This depends on compliance with the Code by each and every operator.

This Code follows a logical sequence in its layout, starting with an operator opening a new site that requires approval from various authorities depending on the site and the nature of the equipment used.

There are several ways of operating bungee jumping. The jumper can arrive at the jump point as a pedestrian, or by being lifted up to the jump point by helicopter, by crane or other lifting appliance, or the jumper may be propelled from the ground by an extended bungee used as a catapult.

In Australia the types of bungee jumping permitted in each State and Territory varies. Operators should check with the appropriate regulatory authority as to the type of bungee jumping permitted and the applicability of this Standard.

There are at present two types of platform used. Static platforms are attached to a permanent structure (e.g. a bridge) or located on the ground. Mobile platforms are attached to a lifting appliance (e.g. crane). There is also the use of a heli-platform (i.e. using a helicopter as a platform for jumping). This Standard recognizes the different safety considerations of jumping over land or water and makes provisions for both types of operations.

The preparation, testing and checking of equipment precedes any operation and each day's operation. Similarly staff selection and training is essential before public operation begins. The Standard provides the framework for the operating procedures. Sites and equipment vary greatly, so each site will require its own operating manual. The content and standards required in the operating manual are set out in the Standard. The risk of serious injury makes provision for emergency procedures essential.

In operations of this kind, standards need to be set and complied with in the early stages of operation. It is easy for complacency and lower standards to become normal when the operation is proceeding without undesired incidents occurring. This must be guarded against.

The use of dynamic loads in the calculation of the safe working load of platforms will be considered at the next revision of the Standard.

The term “informative” is used in this Standard to define the application of the appendix to which it applies. An “informative” appendix is only for information and guidance.

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RELATED DOCUMENTS

NEW ZEALAND STANDARDS

- NZS 4121:1985 Code of practice for design for access and use of buildings and facilities by disabled persons
- NZS 7702:1989 Colours for identification, coding and special purposes

AUSTRALIAN STANDARDS

- AS 1418 Cranes (including hoists and winches) (known as the SAA Crane Code)
- AS 1418.10 -1996 Elevating work platforms
- AS 1735 (Set) Lifts, escalators and moving walks (known as the SAA Lift Code)
- AS 2550 (Set) Cranes – Safe use
- AS 3533 (Set) Amusement rides and devices

JOINT AUSTRALIAN/NEW ZEALAND STANDARDS

- AS/NZS 1891 Industrial fall-arrest systems and devices
- Part 1:1995 Safety belts and harnesses

BRITISH STANDARDS

- BS 903 Physical testing of rubber
- Part A2:1995 Method for determination of tensile stress-strain properties
- BS 2902:1985 Specification. Higher tensile chain slings and rings, links alternative to rings, egg links and intermediate links
- BS 2903:1980 Higher tensile steel hooks for chains, slings, blocks and general engineering purposes
- BS 3551:1962 Alloy steel shackles
- BS 4942:1981 Short link chain for lifting purposes
- BS 6405:1984 Non-calibrated short link steel chain (grade 30) for general engineering purposes: class 1 and 2.

OTHER PUBLICATIONS

New Zealand Department of Labour. Code of Practice – Cranes and Lifting Appliances 1985. Department of Labour, Safety in Construction No. 24, and its accepted Standards for Lifting Gear as listed below:

New Zealand Department of Labour publication, Safe Access 1992

New Zealand Civil Aviation Adventure Rules Pt 115.

The users of this Standard should ensure that their copies of the above-mentioned Standards and referenced overseas Standards are the latest revisions or include the latest amendments. Such amendments are listed in the annual Standards New Zealand Catalogue which is supplemented by lists contained in the monthly magazine Standards issued free of charge to committee and subscribing members of Standards New Zealand.

In Australia, the amendments are listed in the annual Standards Australia Catalogue, and supplemented by lists contained in the monthly magazine The Australian Standard.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
Code of practice for bungy jumping

**Part 1: SITE AND OPERATING APPROVAL, SITE AND
EQUIPMENT DESIGN, CONSTRUCTION AND TESTING**

101 SCOPE

This Standard specifies and gives guidance on the site and site approval, the design, testing and approval of equipment, the management of the operation, the operating procedures, the emergency provisions and procedures, registration of operating staff, certification and audit of a bungy jumping operation.

102 INTERPRETATION**102.1**

For the purposes of this Standard, the word “shall” refers to practices which are mandatory for compliance with the Standard. The word “should” refers to practices which are advised or recommended.

102.2

In this Standard the term ‘bungy jumping’ includes and refers to catapult, static, helicopter and mobile platform jumping facilities.

102.3

This Standard is applicable to all operators of bungy jumping whether for development, demonstration, private or public use.

103 REFERENCES

The full titles of reference documents, cited in this Standard are given in the list of Related Documents immediately preceding Part 1 of this Standard.

104 DEFINITIONS

For the purposes of this Standard the following definitions shall apply:

APPROVING AUTHORITY. The body or person who has the authority to issue permissions, directions, registrations or approvals, with the force of law.

ANCHORAGE POINT. A secure point of attachment on a structure to which a lanyard assembly or restraint line may be secured.

BINDING – ANKLE. Material used to wrap and hold together the jumper’s ankles. The binding is tied together and attached to the bungy cord.

BINDING OF CORD. Material used to hold the cord threads in place. Can also protect the cord threads from damage.

BOBBIN. The cylindrical core around which the bungy cord is laid.

BREAKING LOAD. The minimum load which, when applied under specified loading conditions, causes the equipment to break.

BUNGY CATAPULTING. The jumper is held on the ground while the bungy cord is stretched. On release, the jumper is propelled upwards.

BUNGY CORD. The elastic cord to which the jumper is attached. It lengthens and shortens and thus produces the bouncing action.

BUNGY JUMPING. That activity where a person free falls from a height and the person's descent is limited by their attachment to the bungy cord.

CLOSED WATERS. Where the landing area is part of a constructed swimming pool complex or is specially constructed for bungy jumping.

COMPETENT PERSON. A person who has acquired through training, qualifications or experience, or a combination of these, the knowledge and skills enabling that person to perform a specified task.

NOTE – Appendix A provides suggestions for the training, qualifications or experience considered appropriate to possess for the various competent persons referred to in this Standard.

CONTINUOUS OPERATION. Operating for at least 2 days a week for more than 36 weeks in a 12 month period.

DESIGNED EXTENDED LENGTH. The maximum length to which the cord can be extended.

DIRECT SUPERVISION. Supervision where a person (or persons) is in direct visual and audible contact.

DYNAMIC LOADING. The load placed on the rigging and attachments by the initial free fall of the jumper and the bouncing movements of the jumper. Load expressed as kN.

END ATTACHMENT. The mechanism around which the bungy cord is laid and connected to the jump rigging and jumper.

EQUIPMENT. Equipment includes power or manually operated devices to raise, lower and hold loads.

EQUIPMENT LOG. A record which includes the identification number and utilization rate of specific items of equipment e.g. cords, slings, hoisting device.

FALL-ARREST HARNESS. An assembly of interconnected shoulder and leg straps, with or without a body belt, designed for attachment to a lanyard assembly and used where there is a likelihood of free or restrained fall.

FENCE. A suitable permanent or temporary structure designed and constructed to retain people, within or outside a defined area.

INCIDENT. An event that could or does result in harm to a person, damage or loss of process (jumping interrupted or stopped).

JOB PROCEDURES. A detailed written statement of the steps and actions to be carried out to complete a task. The procedures include the safety factors.

JUMP CONTROLLER (or Site Controller). A jumpmaster who has control of the jump site when jumping is taking place.

JUMP CREW LOG. A logbook kept by each crew member in which is recorded that member's daily on-site activities including the number of hours on-site, the number of jumps and positions held by the crew member.

JUMP DIRECTION (Forward or Backward). The direction in which a jumper is designed to jump from the jump point.

JUMPMASTER. A person who has responsibility for the bungee jumping operation and who takes a jumper through the final stages to the actual jump or release.

JUMPER. The person who free falls from a height attached to a bungee cord.

JUMP HARNESS. An assembly to be worn by a jumper and to be attached to a bungee cord. It is designed to prevent the wearer becoming detached from the bungee cord.

JUMP HEIGHT. The distance from where the jumper begins to fall to the bottom of the jump zone.

JUMP OPERATOR. A person who conducts bungee jumping operations, or parts thereof, under the supervision of a Jumpmaster.

JUMP POINT. The position from which the jumper falls or begins to fall.

JUMP SPACE. The jump zone plus a safety space in all directions.

JUMP ZONE. The space bounded by the maximum designed movements of the jumper or any part of the jumper.

JUMPER WEIGHT. The weight of the jumper as weighed for the jump. Used to classify the range of weights for a specific bungee cord. Weight is expressed in kgs.

KARABINER. A shaped metal device used to connect sections of the jump rigging, equipment or safety gear. (See BS 2903 and BS 3551).

kN (kilo Newton). The force which, when applied to a body having a mass of 1000 kg, gives it an acceleration of 1 m/s^2 .

LANDING AREA. May be either of the following:

- (a) The surface area of ground or water directly under the jump space; or
- (b) Where the lifting appliance moves the jumper so that landing occurs away from the jump space then the landing area shall be:
 - (i) The area covered by the movement of the lifting appliance or part of it; and
 - (ii) The surface area where the jumper lands.

LANDING PAD. A padded area on which the jumper lands by means of the lowering appliance or equipment.

LATERAL DIRECTION. The movement of the jumper measured at 90° to the designed jump direction.

LANDYARD. A line used, usually as part of a landyard assembly, to connect a fall-arrest harness to an anchorage point or static line in situations where there is likelihood of free or restrained fall.

LANDYARD ASSEMBLY. An assembly of a landyard and a personal energy absorber.

LAUNCH. A propelled jump.

LAUNCH POINT. The point from which the jumper is launched.

OPEN WATER. Where the jump space and/or landing area is over sea, lake, river or harbour water.

MANUFACTURER. A producer of bungee equipment.

MAXIMUM DYNAMIC LOAD. The force required to stretch the bungee cord to 4.5 times its unloaded length.

MINIMUM DYNAMIC LOAD. The force required to stretch a bungee to 2.5 times its unloaded length.

MOUSED. Having a safety wire or rope attached to an item of equipment to prevent it from becoming disconnected due to vibration.

OPERATOR. The person who takes responsibility for the bungee operation.

OPERATING LOADED LENGTH. The length of the bungee cord when extended to its specified design length when jumping.

OPERATING SYSTEM. The system of processing a jumper through the jump methods used on a particular site. This includes registration, preparation, getting to the jump point, methods of attachment, the rigging and lowering system and the landing/recovery method.

OPERATING MANUAL. The document that contains the procedures and forms for the operation of the bungee jumping activity on the stated site.

PLATFORM – CATAPULT. The area on the ground from which the jumper is catapulted to a height from which the jumper falls.

PLATFORM – HELICOPTER. The area on the helicopter from which the jumper departs.

PLATFORM – RAISED MOBILE. The area attached to a lifting appliance from which the jumper departs.

PLATFORM – RAISED STATIC. The area attached to a high structure from which the jumper departs.

POINT OF ATTACHMENT. The designated connection point (or points) from which the rigging system (or systems) must be suspended before any bungee jump or catapult operation is carried out.

PREPARATION AREA. The area where the jumper is prepared for jumping. It is a separate area on the ground, on the support structure or part of the platform.

RECOVERY AREA. An area beside the landing area where the jumper may recover from the jump before returning to the public area.

REGULATORY AUTHORITY. A Minister of the Crown, a Government Department, Commission or public authority having power to issue regulations orders or other instructions having the force of law in respect of any subject covered by this Standard.

RESTRAINT BELT. A body belt designed for attachment to a restraint line.

RESTRAINT LINE. A line used to restrict the horizontal movement of the wearer to prevent a fall.

RIGGING SYSTEM. The rigging system is a combination of components that connects the jumper through the bungee cord to an attachment point on the structure, lifting appliance or platform. The rigging system includes components such as ropes, pulleys, karabiners, shackles and lowering equipment.

SAFE WORKING LOAD (SWL). The maximum rated load which can be safely handled under specified conditions, by a machine, equipment or component of the rigging.

SAFETY FACTOR. The ratio obtained by dividing the breaking load of any piece of equipment or rigging by its safe working load.

SAFETY SPACE. A space extending beyond the jump zone as a safety space. That is, a space beyond the maximum designed movements of the jumper.

STRUCTURE. A permanent or temporary building, bridge, tower or similar erection that is used or is proposed to be used for bungee jumping.

TESTING AUTHORITY. (For the purpose of testing the performance of bungee cords.) A body accepted as competent by the Registration or Certification Body concerned.

THREAD. A single strand of material used in a bungee cord. A bungee cord is constructed of a varying number of threads.

UNLOADED LENGTH. The length of the bungee cord between the centres of the end attachments when laid on a horizontal flat surface without load or stress applied.

WINCH HOIST. An electromechanical or hydraulic mechanical apparatus used to raise the jumper back to the jump platform following a jump.

WORKING PLATFORM. An enclosed platform or cage used to carry people, that is attached to a lifting appliance or crane.

105 CLASSIFICATION OF BUNGY JUMPING SITES AND OPERATIONS

NOTE – Check with the appropriate regulatory body to ascertain which classes of bungee jumping are permitted.

The following are the defined classes of bungee jumping sites and operations which shall apply:

- (a) Class A1. Platform – raised static, over land;
- (b) Class A2. Platform – raised static, over water. There is water under all the jump space.
- (c) Class A3. Platform – raised static, over water and land. The jump space extends over water and land.
- (d) Class B1. Platform – mobile, over land;
- (e) Class B2. Platform – mobile, over water. The lifting device and the jump space are over water.
- (f) Class B3. Platform – mobile, over water and land. The crane or lifting device is mounted on the land and the jump space is over water.
- (g) Class C1. Platform – crane catapult over land;
- (h) Class C2. Platform – crane catapult over water;

- (j) Class C3. Platform – crane catapult over water and land;
- (k) Class D1. Platform – helicopter, over land;
- (m) Class D2. Platform – helicopter, over water; and
- (n) Class D3. Platform – helicopter, over water and land;
- (o) Class E1. Catapult – over land;
- (p) Class E2. Catapult – over water and land.

106 SITE AND OPERATING REQUIREMENTS OR APPROVAL

In New Zealand: The owner or operator shall have current written approval from the appropriate authority or authorities to operate on the site.

In Australia: Owners or operators may be required to have current registration as required by state authorities.

107 PLATFORM – RAISED STATIC

107.1 Safe Working Load

The Safe Working Load (SWL) of a platform shall be not less than the sum of the weights of the people and equipment required to be on the platform at any one time. Platforms shall be designed for not less than the required SWL. The factor of safety of any platform, based on failure, shall not be less than 3. If the rigging system(s) is attached to the platform (as distinct from a purpose provided structural element of separate structure) the minimum load for the design of the platform shall be SWL (as above) plus the sum of twice the maximum jumper weight as specified in the site operating manual and the maximum weight of the rigging system(s) acting at the point of attachment.

107.2 Attachment to the structures

Where the point of the attachment of the rigging system is not part of the platform, the structure carrying the point of attachment shall be designed to achieve a factor of safety, based on the failure of any component in the load path to the foundation, of not less than 3 when loaded by the total of 3 times the maximum weight of the jumper specified in the site operating manual and the maximum weight of the rigging system(s) acting at the point of attachment.

107.3

The maximum jump weight (individual or tandem) shall not exceed 235 kg.

107.4

On any platform, there shall be displayed:

- (a) The maximum jump weight for the site;
- (b) The SWL of the platform.

107.5

The platform should have a slip resistant floor surface.

107.6

The platform should have sufficient working space for the required number of persons.

107.7

The platform shall have anchorage points or rails for fall-arrest harnesses and restraint belts, designed and placed to best suit the operator's movements. Anchorage points shall be designed to withstand a force of 20 kN in the direction of likely fall.

107.8

The platform shall be fitted with a permanent fence to exclude the public and to contain the jumper during preparation.

In Australia: In addition to the requirement for platforms to be fitted with a permanent fence, platforms shall be provided with a toe-board not less than 100 mm high around the periphery except for the jump point, which shall remain clear of obstructions.

107.9

The jumpers shall be prepared for jumping in a place separated from the jump point.

107.10

There shall be a means of preventing jumpers accessing the jump point until attached to the bungy.

107.11

The top end of all bungy cords on the platform, other than those in closed storage containers, shall be securely attached to the rigging bar or the rigging at all times.

107.12 Wind speeds

The jumpmaster shall stop the jumping operation when the wind speed affects the safe operations on the jump platform and/or of the landing recovery system. The operations manual shall provide criteria on which this decision is based.

107.13 Recovery system**107.13.1**

The system for recovering the jumper shall be operated by either the jump operator or the jumpmaster. The alternate person shall be able to observe the recovery operation and shall have available means to stop the recovery if necessary.

107.13.2

There shall be an alternative method of jumper recovery should the main recovery system fail to recover the jumper.

107.14 Rigging adjustments

Where the rigging is adjusted to alter the jump height for individual jumpers, the adjustable portion of the rigging system shall be calibrated or marked to assist in selecting the required adjustment.

108 PLATFORM – MOBILE**108.1**

In New Zealand: The platform and its lifting crane shall meet the requirements of the Department of Labour Code of Practice – Cranes and Lifting Appliances. This Code requires that for working platforms (that carry people) the crane's SWL, shall be reduced by 50 %. Other lifting appliances shall meet such similar requirements as are applicable to the lifting device.

In Australia: The crane shall comply with the requirements of AS 1418. Where working platforms carrying people are lifted, the SWL of the crane shall be reduced to 33 %. Other lifting appliances shall meet such similar requirements as are applicable to the type of lifting device.

NOTE – This requirement may not be applicable in all States and Territories.

108.2

108.2.1

Cranes used for bungee jumping shall have a safety catch fitted to the hook, and shall have the facility for power raising and power lowering of the platform. Where a free-fall lowering system is available on the crane, such a system shall be locked out to prevent accidental use.

108.2.2

An anti-two-blocking device shall be installed.

108.3

In New Zealand: For the purpose of bungee jumping, the use of the crane or lifting appliance, the platform and platform rigging shall be approved in writing by the Department of Labour or equivalent organization.

In Australia: The use of cranes or lifting appliances for the purpose of bungee jumping is subject to registration by the appropriate authorities.

108.4

For crane operation the jump platform rigging and cables as well as the jump rigging shall be attached to the lifting hook either directly or by means of the primary shackle.

108.5

The jump rigging shall pass through or around the platform in such a way as to eliminate damage to any part of the rigging system and particularly the bungee cord.

108.6

The mobile platform for jumping shall be at a constant height above the ground or surface when ready for jumping. That is, adjustments for the weight of each jumper shall be made by the jumpmaster's selection of bungee cord and adjustments to the rigging, not by altering the height of the platform.

A safe and reliable means of assisting the crane driver to maintain a constant lift height should be fitted. Anti-blocking devices shall not be used for this purpose.

108.7

The Safe Working Load (SWL) of a platform shall be not less than the sum of the weights of the people and equipment required to be on the platform at any one time. Platforms shall be designed or selected to satisfy the required SWL. The factor of safety of any platform, structure or component of its suspension system, based on failure by yield shall not be less than 3.

108.8

The SWL for any crane, as determined by 108.1, shall not be less than the sum of the weights of the platform and its suspension rigging, the SWL of the platform and twice the maximum jumper weight, as specified in the site operating manual, together with the maximum weight of the rigging system(s).

108.9

The maximum jumper weight (individual or tandem) shall not exceed 235 kg.

NOTE – The approved SWL of the crane determines the maximum total load imposed on the crane.

108.10

On any platform, there shall be displayed:

- (a) The maximum jump weight for the site;
- (b) The SWL of the platform.

108.11

The platform should have a slip resistant floor surface.

108.12

The platform should have a minimum floor area of 0.2 m^2 per person.

108.13

There shall be a rope or chain barrier or gate across the jump point until the platform reaches the jump height.

108.14

The platform shall have anchorage points for fall-arrest harnesses or restraint belts for all persons carried on the platform and these each shall be capable of withstanding a force of 20 kN in the direction of likely fall.

108.15

All operators on the mobile platform shall wear a fall-arrest harness or restraint belt and shall be secured to an anchorage point.

108.16

All passengers and the jumper shall wear restraint belts attached to anchorage points. The jumper may remove the restraint belt once connected to the bungy cord and the platform is at the jump height and position.

108.17

Where a chair for the jumper is fitted it shall be attached to the platform and shall be fitted with a safety belt.

108.18

There shall be an alternative method of jumper recovery should the main lowering system fail to lower the jumper.

108.19

The design of the platform and support straps shall provide for maximum stability of the platform.

108.20

The position of the jump point in relation to the crane boom or jib shall be controlled to enable the jump to be in the designed direction. This shall be at $90^\circ \pm 10^\circ$ to the jib.

108.21 Lifting gear

All lifting gear connecting the platform to the lifting appliance shall have a safety factor of at least 3.

108.22

All shackles shall be moused.

108.23

In New Zealand: All lifting gear shall meet the standards as set out in the Department of Labour Code of Practice – Cranes and Lifting Appliances.

In Australia: All lifting gear shall meet the relevant Australian standards.

108.24 Wind speeds

The decision to operate or not is the sole responsibility of the lifting appliance driver. The decision to prepare jumpers to jump is the responsibility of the jumpmaster.

108.25 Checking of lifting appliance

The jumpmaster shall ensure the following checks are carried out to an approved schedule:

- (a) That there are established lines of communication between the jump platform and the appliance operator, and between the appliance operator and the ground team;
- (b) That the lifting appliance has current appropriate working certificates;
- (c) That the hoist rope has sufficient length for the working heights. The appliance operator shall run out the rope and the rope shall be given a visual inspection.
- (d) That all shackles and pins are moused or secured with an appropriate locking mechanism;
- (e) That all outriggers are fully extended and are correctly blocked up;
- (f) The signals required for communication between the person operating the lifting appliance and the person directing such an operation are fully understood, and comply with 129.1(c);
- (g) That the appliance operator knows who is directing the appliance.

NOTE – In Australia the crane shall be used in accordance with the requirements of AS 2550 or with applicable regulations.

109 PLATFORM – STRUCTURE CATAPULT LAUNCH**109.1**

The platform from which the participant is catapulted shall be nominally level. Floor surfaces within the platform should be slip resistant.

109.2

The jumper preparation area shall be a separate fenced area, adjacent to the platform and landing area.

109.3

Where an anchor block is used to restrain the participant prior to catapulting, the anchor block shall be suitable to hold the maximum load to be applied. Other means of restraining the participant which provide an equivalent level of restraint may be used. The means of restraint shall be designed with a safety factor of at least three.

109.4

A means of ensuring that the intended initial extended length of the bungy cord is consistently achieved shall be provided. Where the rigging is adjusted to alter the height and trajectory of individual jumpers, the adjustable portion of the rigging system shall be calibrated or marked to assist in selecting the correct adjustment.

109.5

To ensure that the trajectory of the jumper clears the structure and to minimize the jumper's contact with the bungy cord during the jump, the position of the jumper on the platform shall be offset from a point vertically beneath the rigging attachment point on the structure by a distance that shall be determined empirically, by using test loads which represent the lightest jump load.

- (a) For jump heights of not less than 30 m, 1.8 m;
- (b) For jump heights of less than 30 m, as determined by:
In New Zealand: a registered engineer
In Australia: a competent person

109.6

In any event the offset distance shall not affect the stability of the structure.

109.7

The weight of the jumper shall be fully supported by the harness before the jumper is released.

109.8

The jumper shall be in such a position that the release straps clear the jumper.

109.9

The launch release mechanism shall release the jumper cleanly and shall not interfere with the jumper after release.

109.10

The jumpmaster shall stop jumping operations when the wind speed affects the safe operation of jumping or recovery operations.

109.11

The system for lowering the jumper to the landing pad shall be operated by either the jump operator or the jumpmaster. The alternate person shall be able to observe the lowering operation and shall have available means to stop the lowering if necessary.

109.12

In the event of the primary lowering system failing to operate, there shall be an alternate method for recovering the jumper.

NOTE – The operating manual shall specify the means of recovery with consideration of the maximum recovery times.

109.13

To ensure that the trajectory and height of the launch jump is within the designed jump zone and to minimize contact with the cord during the jump, the following shall apply:

- (a) The maximum jumper weight range of any one bungy cord shall be 15 kg;
- (b) The maximum operating extended length of a bungy cord shall be 3 times its unextended length.

109.14

The range of bungy cords used on any one day shall be consistent in their quadruple extended length. This means, that the bungy attachment point is at the same height for the maximum operating extension of all the bungy cords.

110 PLATFORM – CRANE CATAPULT LAUNCH

110.1

In New Zealand: The lifting crane shall meet the requirements of the Department of Labour Code of Practice – Cranes and Lifting Appliances. The requirement in this Standard to reduce the SWL by 50 % for working platforms shall apply to cranes used for catapult launched bungy jumping. Other lifting appliances shall meet such similar requirements as are applicable to the lifting appliance.

In Australia: Where crane catapult operations are permitted the lifting crane shall be used in accordance with the requirements of AS 2550 or with applicable regulations.

110.2

The use of the crane or lifting appliance, for the purpose of bungy jumping shall be approved in writing by the Department of Labour (in the case of New Zealand) or regulatory authority (in the case of Australia).

110.3

The jump rigging shall be attached to the lifting hook.

110.4

The platform shall be on a flat surface and in the same area as the landing area.

110.5

The jumper preparation area shall be a separate fenced area adjacent to the platform/landing area.

110.6

The anchor block shall have a mass suitable to hold the maximum load to be applied with a safety factor of at least 3.

110.7

The anchor block shall have its weight displayed on the block.

110.8

To ensure that the trajectory of the jumper clears the crane hook and to minimize the jumper's contact with the bungy cord during the jump, the following shall apply:

- (a) For jump heights of 30 m or greater, the angle of the jumper to the crane jib shall be offset not less than 1.8 m from the plumb line of the crane hook (see figure B8);
- (b) For jump heights of less than 30 m or where a variation of (a) is required, the offset distance shall be determined by the registered engineer in New Zealand or the competent person in Australia;
- (c) The maximum offset distance shall not reduce the stability of the crane for the safe operation of bungy jumping.

110.9 Checking of crane

The crane operator in conjunction with the jumpmaster shall check the following:

- (a) That there are established lines of communication between the crane operator and the ground staff;
- (b) That the crane has a current appropriate working certificate;
- (c) That the hoist rope has sufficient length for the working heights;

