


**MINISTRY of TRANSPORT**  
MARINE DIVISION



**POWER LIFT RULES**  
**1980**

FOREWORD

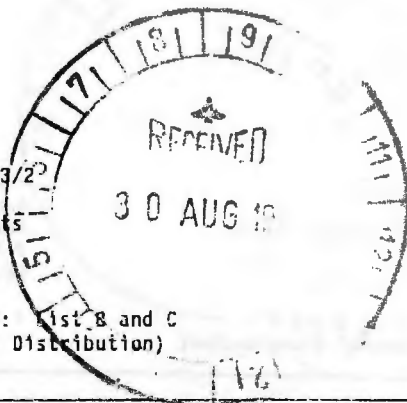
The purpose of these Rules is to establish the Marine Division's requirements for the safe design, construction and installation of Power Lifts over 0.75 kw (1hp). Grateful acknowledgement is made to all those who assisted in formulating these Rules and in particular to the Standards Association of Australia for permission to quote from their Lift Code SAA 1735.

  
J. Critchley  
Chief Engineer Surveyor

File No. 41/3/25

Binder: Lifts

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Survey No. 1988/52

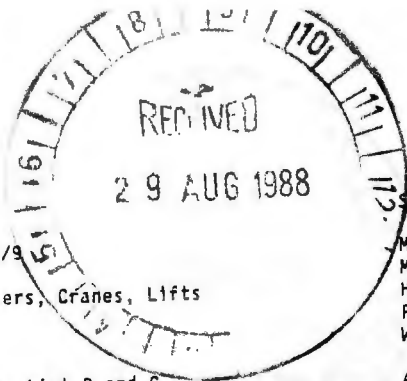
MINISTRY OF TRANSPORT  
Marine Division  
Head Office  
P.O. Box 3175  
WELLINGTON

14 July 1986

APPLICATION OF NZS 4121 "CODE OF PRACTICE FOR DESIGN FOR  
ACCESS AND USE OF BUILDINGS AND FACILITIES BY DISABLED PERSONS"  
IN RESPECT OF LIFTS

1. The Disabled Persons Community Welfare Act 1975, Section 25(1) in relation to "Access to, and facilities at, premises open to the public" requires in effect that reasonable and adequate provision be made for such disabled persons as may be expected to visit, or, work in, any new or reconstructed building.
2. Section 25(2) of that Act states:  
  
"Any provision that is made in accordance with New Zealand standard specification No. 4121 (being the code of practice for design for access by handicapped persons) and any amendments thereto (whether made before or after the commencement of this Act), or in accordance with any standard specification that is in substitution therefor, shall, for the purposes of subsection (1) of this section, be deemed to be a reasonable and adequate provision."
3. Please ensure when submitting data to the Marine Division, Head Office for design approval of lifts that those lifts which are required to comply with NZS 4121 are clearly identified.
4. Please note that it is not possible to complete the design approval of lifts, or, the safety inspection and certification of new lifts until this information is received and it has been established that the requirements of NZS 4121 have been complied with.
5. Engineer Surveyors are requested to ensure that these requirements are made known as widely as possible and lift installation companies may obtain additional copies for further distribution to building owners, architects and property developers on request to Marine Division, Head Office.

J.M. Stark  
Chief Engineer Surveyor



File No. 41/0/9

Binder: Boilers, Cranes, Lifts

Survey No. 1988/51

MINISTRY OF TRANSPORT  
Marine Division  
Head Office  
P.O. Box 3175  
WELLINGTON

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4 July 1988

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Part 1  
General  
Requirements

SECTION 1 - SCOPE1.1 SCOPE

These Rules shall apply to the design, construction, maintenance, inspection, testing and operation of lifts subject to the Boilers, Lifts and Cranes Act, 1950 and amendments, except where exemption from a statutory requirement is given by an Order in Council or by a Notice in the Gazette.

The Rules do not apply to the following machinery:

- (a) Lifts used solely in connection with the construction, alteration, repair, renewal or demolition of a building.
- (b) Stacking machines and similar portable devices.
- (c) Conveyors used for the handling of goods such as swing tray elevators, bucket conveyors, and similar appliances.
- (d) Skip Hoists.
- (e) Amusement devices.
- (f) Lifts or winding apparatus, used for raising or lowering men or materials in mines inspected by the Mines Department.
- (g) Hand Power Lifts.
- (h) Power driven lifts where the motive power does not exceed 0.75 kW (refer to rule 1.2).

## 1.2

POWER DRIVEN LIFTS WHERE THE MOTIVE POWER DOES NOT EXCEED 0.75 kW

All power driven lifts where the motive power does not exceed 0.75 kW shall comply with Part 5 of these Rules. The standard and quality of all the materials, workmanship and fittings shall be equal to that which would be required by the Chief Engineer Surveyor for lifts built under full supervision. The manufacturer is responsible for ensuring compliance with these requirements.

### 1.3 APPLICATION OF THE RULES

These Rules shall become effective on 1 May 1980. All lifts which were contracted for sale before this date may be designed to the 1958 Rules for Power Lifts providing the designs are submitted for approval and received by this Division on or before 30 August 1980. The Rules must be applied in their entirety together with all additions and amendments.

Notwithstanding the contents of any part of these Rules, no lift installation shall be designed, fabricated or installed in any manner which would preclude sound engineering practice.

### 1.4 EXISTING LIFTS

These Rules shall apply to every existing lift installation to the extent considered necessary by an Engineer Surveyor to enable him to be satisfied that the lift is securely guarded and is in good repair and may be safely used for the purpose for which it is then used or intended to be used. Whenever any existing lift is re-erected or is subject to material alterations, it shall comply fully with these rules.

#### NOTE:

"Material alteration" means an alteration requiring a reconstruction of the major part of a lift such as a conversion from goods to passenger lift, an extension of travel by addition of a new floor or floors, an increase in the carrying load requiring a new hoisting machine and new ropes, a conversion of hydraulic or belt driven lift to electric drive, etc. Where any doubt exists as to the application of these Rules the matter should be referred to the Chief Engineer Surveyor.

Subject to the preceding paragraph the reconditioning or modernisation of an existing lift whereby the general standard of safety is raised shall not be considered a "material alteration", nor shall the change-over in power supply from direct current to alternating current or vice versa, with either the existing or a new machine, be considered a "material alteration"; provided that if an increase of speed requested by the owner is approved by the Department the increase shall not exceed 10 percent.



SECTION 2 - GENERAL**2.1        STATUTORY OBLIGATIONS****2.1.1       Abstracts from the Boilers, Lifts and Cranes Act, 1950, Relating to Lifts.****THE BOILERS, LIFTS AND CRANES ACT 1950  
1950, No. 53**

An Act to make provision for the inspection and certification of boilers, lifts, cranes, and certain other machinery, for the safety of persons working with boilers or machinery to which the Act applies, and for the qualification of persons operating any such boilers or machinery. (23 November 1950).

1. Short Title and commencement - (1) This Act may be cited as the Boilers, Lifts, and Cranes Act 1950.  
(2) This Act shall come into force on the first day of January, nineteen hundred and fifty-one.
2. Interpretation - (1) In this Act, unless the context otherwise requires -

"Lift" means an appliance used for raising and lowering persons or goods by means of a car or platform the movement of which in a vertical or approximately vertical direction is maintained by guides; and includes the supports, well, enclosures, car, and the whole of the mechanical and electrical apparatus required in connection with the operation and safety of a lift:

"Machinery" means a lift, crane, winding engine, or steam engine:

"Minister" means the Minister of Transport:

"Owner", in relation to any boiler or machinery to which this Act applies, includes the mortgagee or lessee thereof, and any engineer, overseer, foreman, agent, or person in charge or having or apparently having the control or management of the boiler or machinery:

"Premises" includes any yard, place, house, or building and any farm, paddock, field, road, or place, in which any boiler or machinery is kept, worked, or used, or is in operation:

"Secretary" means the Secretary of the Ministry of Transport:

"Surveyor" or "Engineer Surveyor" means an Engineer Surveyor appointed under this Act:

6. Powers of Surveyors - (1) Every Surveyor may -

- (a) Enter any premises at all reasonable hours by day or night if he has reasonable cause to believe that any boiler or machinery to which this Act applies is in use or working or kept therein, and may then and there inspect and examine the boiler or machinery:
- (b) Take with him a constable or any person he may think competent to assist him in the execution of his duty:
- (c) Make such examination and inquiry as he deems necessary in order to ascertain whether the provisions of this Act are complied with:
- (d) Examine with respect to matters under this Act, either alone or in the presence of any other person, as he thinks fit, every person whom he finds in any premises and require any such person to make and sign a statutory declaration as to the matters with respect to which he is so examined:
- (e) Require the owner of any boiler or machinery to which this Act applies to explain the working thereof:

(2) No person shall, on an examination or inquiry by a Surveyor under this section, be required to answer any question tending to incriminate himself.

(3) Except for the purposes of this Act and the exercise of his functions under this Act, a Surveyor shall not disclose to any person any information which in the exercise of those functions he acquires with respect to any boiler or machinery.

7. Owners to allow entry and inspection - The owner and his agents and servants shall at all times furnish the means required by any Surveyor for an entry, inspection, examination, and inquiry or the exercise of any other powers under this Act.

11. Issue of certificates of inspection - (1) Where a Surveyor has inspected any boiler or machinery to which this Act applies and is satisfied -
- (b) In the case of a lift, crane, or winding engine that it is securely guarded and is in good repair and may be safely used for the purpose for which it is then used or intended to be used -

he shall report to the Secretary accordingly, who, if satisfied that all requirements of this Act have been complied with, shall, on payment of the prescribed fee, issue to the owner a certificate in such form as the Minister from time to time approves.

- (3) Any certificate issued under this section to the owner of a lift or crane may contain such conditions in respect of the number of passengers or the load that may be carried by the lift, or in respect of the load that may be carried by the crane, as the Minister thinks fit.

13. Duration of certificate for other machinery - (1) Subject to the provisions of subsection three of this section, the certificate issued to the owner of any machinery to which this Act applies for which a certificate is required shall remain in force for such period as may be stated in the certificate in that behalf.

- (2) Any such period shall not exceed -

- (a) Six months in the case of a lift;

(3) The Secretary may, on the report of a Surveyor, cancel or suspend any such certificate if any material alteration is made in or to the machinery, or if the machinery is not at all times kept securely fenced and guarded and in good repair, and fit to be safely used for the purpose for which it is used, or in any other case in which he deems cancellation or suspension of the certificate to be necessary in the interests of safety.

14. Certificate to be exhibited in conspicuous place - (1) The certificate granted to the owner of any boiler or machinery to which this Act applies shall be exhibited in some conspicuous place where it can be readily seen by all persons working at or with the boiler or machinery.

16. Persons having boilers and machinery subject to Act to notify Surveyor - (1) Every person who becomes the owner of any boiler or machinery to which this Act applies shall within one month thereafter send to the Surveyor for the time being in charge of the district where the same is, or in which it is intended to use, keep, or work the same, a notice stating the name of the owner, the place or town where the boiler or machinery is erected, kept, or intended to be used, and the nature and kind of the boiler or machinery.  
(2) Every person who sells or absolutely disposes of any such boiler or machinery to any person shall forthwith give notice to the Surveyor stating the name, occupation, and abode of the person to whom the sale or disposition has been made.
17. Chief Surveyor may prescribe standard requirements -  
(1) The Chief Surveyor may from time to time prescribe standard requirements to be observed in the design and construction of boilers, lifts, and cranes so as to secure the safe working thereof.
18. Drawings of boilers, lifts, and cranes to be submitted to Chief Surveyor - (1) The owner or other person at whose request the first inspection of any boiler, lift, or crane is made shall, not later than the date of making application for that inspection, forward to the Chief Surveyor a drawing of the boiler, lift or crane accompanied by the prescribed fee and containing all such dimensions and other particulars as may be necessary to enable the Chief Surveyor to determine whether or not the Chief Surveyor's requirements have been complied with.  
" (2) The writing on any such drawing and on any other documents relating to such drawing shall be in the English language".
19. When boilers and machinery to be inspected -  
(2) Lifts shall be inspected at least once in every six months.
28. Lifts - (1) Except for the purpose of a test required and witnessed by a Surveyor, no person in charge of a lift shall permit to be carried on the lift any number of passengers, or any load, greater than that stated in the certificate given under section eleven of this Act in respect of the lift.

(2) No person shall wilfully damage a lift or remove or interfere with any safeguard, fence, or safety device of a lift.

"(3) The owner of a lift shall keep the lift and all of its safety devices in good and safe condition during all times when the lift is in use and, if a certificate under section 10 of this Act is issued in respect of the lift, during the currency of the certificate".

(4) The owner of a lift shall, before making any material alteration or repairs to the lift, give to the Surveyor notice in writing setting forth full particulars of the proposed work.

30. Young persons not to be employed in certain cases - (2) No lift of any kind, other than an automatically controlled passenger lift that may be brought into operation by the pressure of a button which causes the lift car to start and to stop automatically at the landing corresponding to the button pressed, shall be worked unless it is in charge of a male attendant of at least eighteen years of age or a female attendant of at least twenty years of age. For the purposes of this subsection an attendant shall mean a person who has been specially employed or authorised in that behalf by the owner of the lift or his agent.

34. Surveyors to be notified of accident - (1) Where any person is killed or suffers serious bodily injury by reason of the explosion of a boiler, or as a result of an accident caused by machinery to which this Act applies, the owner of the boiler or machinery shall within twenty-four hours after the explosion or accident send notice thereof to a Surveyor at his office or usual place of residence, and the Surveyor shall forthwith transmit the notice to the Secretary.

(2) As soon as practicable after receiving any such notice or otherwise becoming aware of any such explosion or accident the Surveyor, or some other Surveyor, shall go to the place where the explosion or accident occurred and make such inquiry as he thinks fit as to the cause of the explosion or accident, and for that purpose may examine the owner of the boiler or machinery and all persons employed about the boiler or machinery, and shall report to the Secretary the result of the inquiry.

(3) It shall not be lawful for any person to do any act likely to prevent the discovery of the cause of the explosion or accident until the Surveyor has visited the scene thereof and completed his inquiry:

Provided that nothing in this subsection shall prohibit the owner from doing anything reasonably necessary to prevent further damage or injury to any person or property, or from disconnecting a boiler from others connected with it.

(4) Every person commits an offence against this Act who -

- (a) Fails to give the notice required by subsection one of this section; or
- (b) Except as authorised in the proviso to subsection three of this section, does or causes to be done any act likely to prevent the discovery of the cause of the explosion or accident.

2.1.2

Other Acts of Parliament and Local By-laws. These Rules shall be considered in conjunction with any other Act of Parliament or local by-law issued by any local authority having control over lift installations.

These Rules establish minimum standards for lift installations and shall in no way supersede applicable by-laws, etc., which require more stringent standards.

2.2

EARTHQUAKE LOADINGS

NZS4203 'Code of practice for General Structural Design And Design Loadings For Buildings' (with all up to date amendments) shall be used for determining loadings due to seismic accelerations on lift machinery, lift guides, lift car and landing doors and stand-by equipment where called for in these rules.

2.3

DISPENSATIONS FROM THESE RULES

The Chief Engineer Surveyor may at his discretion give a dispensation from any particular requirement of these Rules for a particular lift, where he considers that the circumstances warrant it.

Such dispensations will be in writing over the signature of the Chief Engineer Surveyor or the Assistant Chief Engineer Surveyor only and will specify in full the extent of dispensation from these Rules.

The dispensation may be revoked by the Chief Engineer Surveyor or Assistant Chief Engineer Surveyor at any time in writing.

## 2.4

DRAWING AND PARTICULARS OF THE LIFT INSTALLATION TO  
BE SUBMITTED

- (i) Complete working drawings of the lift car and lift installation. All the relevant structural information and dimensions must be shown.
- (ii) Lift particulars sheet (see rule 2.5).
- (iii) Overhead beam loading diagrams. These must include spans section and precise positions and magnitudes of the loads imposed.

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2.5

LIFT PARTICULARS

(All dimensions in millimetres unless otherwise specified)

Owners name \_\_\_\_\_  
address \_\_\_\_\_  
Location of lift \_\_\_\_\_

Lift maker

Type of lift

Duty

Installation engineers

Building class 1/2/3

type

importance factor

Machine maker

type - traction/drum

if drum overtravel to fixed stop

clearance under lifting beam.

Rated load (kg)

Rated speed (m/s)

Terminal speed checking and stopping

device : fitted/not fitted

if fitted speed at contact

with buffer (m/s)

Floors served

Openings served

Main floor at level no.

Total lift travel (m)

Car weight (kg)

openings

opening height \_\_\_\_\_ width \_\_\_\_\_

platform width \_\_\_\_\_ depth \_\_\_\_\_

inside width \_\_\_\_\_ depth \_\_\_\_\_

floor

sides and top

bow members

sling members

buffer members

Car platform members

platform direct on

buffer members/

isolators

buffers no.

buffers type

buffers stroke

guides

guides eccentricity

guides vertical centres .

guides horizontal centres

guide brackets

guide fixing centres

top man clearance



LIFT PARTICULARS (CONT)Car top mechanical clearance

buffer clearance

bottom man clearance

clearance to landing sill

clearance to liftwell

\* guide roller to heel of rail

\* height of equipment above  
weight on bow members (kg)

safety gear type A/B/C/D

Hoist ropes

roping 1:1 2:1 3:1

rope diam

rope construction

rope effective no.

breaking strength/rope (tonnes)  
maker

eye bolt dia.

Counterweight weight (kg)

buffers no.

buffers type

buffers stroke

guides

guides brackets

guide fixing centres

tie bracket section

tie bracket Zyy (cm<sup>3</sup>) =  
ht =

top clearance

buffer clearance

safety gear type A/B/C/D

Machine position

weight (kg)

gear ratio

traction sheave dia.

traction sheave shaft dia.

diverter sheave dia.

diverter sheave shaft dia.

motor (kw)

motor r.p.m.

governor type

governor rope dia.

governor tripping speed

Liftwell enclosureLanding entrances

clear opening height

clear opening width

door locks

Terminal stopping device:-

cam operated from car

selector in m/room driven by car

electro-mechanical inductors

Final terminal stopping devicesMain beams no.

span

section

reactions

point load diagram

supporting columns

total suspended load (kg)

DRAWING REF. NO.

## 2.6

CERTIFICATES TO BE SUBMITTED

The following aspects of the design and/or construction of the lift installation shall be verified as to compliance with these Rules by a Certificate from an approved signatory.

- (i) The electrical installation rule (24.25) -A registered engineer, however compliance with the Electrical Wiring Regulations may be verified by the local Power Supply Authority.
- \* (ii) The hoist ropes (rule 16.1) - Telarc approved test laboratory.
- \* (iii) Oil buffers (rule 10.5.8) - Telarc approved test laboratory.
- (iv) The analysis of loads for supporting and overhead structures i.e. beams, trimmer beams, floors, foundations, lifting beams etc (rules 6.3 and 20.12.2) Registered engineer.
- \* (v) Strength of enclosures (rule 12.2) - Telarc approved test laboratory or a Registered engineer.
- \* (vi) Strength of car and landing doors (rule 13.3.1) - Telarc approved test laboratory or a Registered engineer.
- (vii) Welder qualification Certificates - Certificates to be sighted by inspecting Engineer Surveyor.
- \* Type tested equipment by recognised overseas testing laboratories will be accepted providing they are accompanied by the required documentation.

## 2.7

CERTIFICATE OF INSPECTION

A valid and current certificate of inspection shall at all times be displayed in the car. The certificate must be placed in a clear vandal proof frame which is securely fixed to a wall of the car in a conspicuous position.

### SECTION 3 - DEFINITIONS

#### 3.0 APPLICATION OF SECTION

The following terms where used throughout these Rules, shall have the meanings given to them in this section.

NOTE: A number of terms, which do not appear in the Rules, have been included for the convenience of architects, engineers and manufacturers as a means of promoting standardization of nomenclature in the lift industry.

#### 3.1 ALTERATION

Any change in the design of or addition to the equipment other than ordinary maintenance repairs or replacements.

#### 3.2 ANNUNCIATOR, CAR

An electrical device in the car which indicates visually the landings at which a lift landing signal registering device has been actuated.

#### 3.3 APPROVED

Approved in writing by the Chief Engineer Surveyor.

#### 3.4 APRON

See 3.23 'Car apron or landing apron'.

#### 3.5 ASTRAGAL

A moulding applied to the meeting faces of a door panel and/or door jambs.

#### 3.6 ATTENDANT

A person who has been specially employed or authorised in that behalf by the owner of the lift or his agent to be in charge of operating the lift. (refer clause 30 of the Boilers, Lifts and Cranes Act 1950).

3.7 ATTENDANT CONTROLLED LIFT

A lift which is directly under the control of an attendant (refer above) and which can be started only by means of a starting switch or button in the car, and cannot be controlled from landing pushes.

3.8 AUTHORIZED PERSON

A person authorized or selected by the owner or person in charge of a building to carry out duties, other than those of lift attendant or lift engineer, in connection with the lift.

3.9 BOW MEMBER

The top horizontal member of the car frame.

3.10 BUFFER

A device designed to absorb the impact of a lift car or counterweight.

3.11 BUFFER CLEARANCE, CAR

The distance between the car buffer striker plate and the striking surface of the fully extended car buffer when the car floor is level with the bottom landing.

3.12 BUFFER CLEARANCE, COUNTERWEIGHT

The distance between the counterweight buffer striker plate and the striking surface of the fully extended counterweight buffer when the car floor is level with the top terminal landing.

3.13 BUFFER MEMBER

The bottom horizontal member of the car frame.

3.14 BUFFER, OIL

A buffer using oil as a medium which absorbs and dissipates the kinetic energy of the descending car or counterweight.

3.15 BUFFER, OIL, STROKE

The oil-displacing movement of the buffer, plunger or piston, excluding the travel of the buffer plunger accelerating device.

3.16 BUFFER, SPRING

A buffer which is capable of absorbing, in a spring, the kinetic energy of the descending car or counterweight.

3.17 BUFFER, SPRING, LOAD RATING

The load required to compress the spring an amount equal to its stroke.

3.18 BUFFER, SPRING, STROKE

The maximum distance the contact end of the spring can move under a compressive load.

3.19 BUFFER, SOLID

A device, other than an oil or spring buffer, designed to stop a descending car or counterweight by absorbing the impact.

3.20 CAM (RAMP)

A wedge-shaped device fixed in a liftwell or on a car or counterweight and serving to operate control apparatus by means of the movement of the car or counterweight.

3.21 CAM, RETIRING

A device incorporating a cam attached to a car and arranged to retract automatically from its operating position.

3.22 CAR

The load-carrying unit including its platform, car frame enclosure and car door.

3.23 CAR APRON OR LANDING APRON

A protective screen, attached to the underside of the car platform or lift landing sill to prevent objects being trapped between the car platform and landing threshold.

3.24 CAR DOOR

A single or multipanel door that closes a car entrance.

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3.25 CAR ENCLOSURE

The enclosing body of the lift car which comprises the sides and roof, and which is built upon the platform.

3.26 CAR ENTRANCE

The opening in the car enclosure through which normal access is available between the lift car and landings.

3.27 CAR FRAME

The supporting frame to which the car platform, upper and lower sets of guide shoes, car safety gear and the hoisting ropes or hoisting-rope sheaves are attached.

3.28 CAR FRAME, OVERSLUNG

A car frame to which the hoisting-rope fastenings or hoisting-rope sheaves are attached to the top horizontal member of the car frame.

3.29 CAR FRAME, UNDERSLUNG

A car frame to which the hoisting-rope fastenings or hoisting-rope sheaves are attached to the bottom horizontal member of the car frame.

3.30 CAR PLATFORM

The structure which forms the floor of the car and which directly supports the load.

3.31 CLEARANCE, MECHANICAL, BOTTOM CAR

The clear, vertical distance from the pit floor to any fitting attached to the car when the car rests on its stops or fully compressed buffer.

3.32 CLEARANCE, MAN, BOTTOM CAR

The clear vertical distance from the pit floor to the lowest structural or mechanical part, equipment or device installed beneath the car platform, excepting guide shoes, guide rollers, safety jaw assemblies and platform aprons or guards, when the car rests on its stops or fully compressed buffer.

3.33 CLEARANCE, MECHANICAL, TOP CAR

The shortest vertical distance between any equipment mounted on the top of the car and the nearest part of the overhead structure, when the car floor is level with the top terminal landing.

3.34 CLEARANCE, MAN, TOP CAR

The shortest vertical distance between the top of the car crosshead or between the top of the car where no crosshead is provided and the nearest part of the overhead structure, when the car floor is level with the top terminal landing.

3.35 CLEARANCE, TOP, COUNTERWEIGHT

The shortest vertical distance between any part of the counterweight or component mounted thereon and the nearest part of the overhead structure or any other obstruction when the car floor is level with the bottom terminal landing.

3.36 COMPENSATING ROPES AND CHAINS

Ropes or chains, suspended from the car frame and counterweight to balance the weight, or part of the weight, of the hoist ropes throughout the travel of the car.

3.37 CONTACT, CAR DOOR

A contact operated by the movement of a car door in such a manner that electrical contact is made only when the door is closed.

3.38 CONTACT, ENCLOSURE OR LANDING DOOR

A contact operated by the enclosure or landing door in such a manner that electrical contact is made only when the door is closed.

3.39 CONTACTOR

An electro-magnetically operated switch for making or breaking a main electrical circuit.

3.40 CONTROL

The system governing the starting, stopping, direction of motion, acceleration, speed and retardation of the lift.

3.41 CONTROL, RHEOSTATIC

A system of control which is accomplished by varying resistance and/or reactance in the armature/rotor and/or field/stator circuit of the driving machine motor.

3.42 CONTROLLER

A device or group of devices which directs the operation of the equipment and/or its auxiliaries.

3.43 COUNTERWEIGHT

A moving weight employed to balance the weight of the lift car and part of the rated load.

3.44 DOOR, BIPARTING

A vertically or horizontally sliding door, consisting of two or more sections so arranged that the sections or groups of sections open away from each other and so interconnected that all sections operate simultaneously.

3.45 DOOR, LANDING

A single or multipanel door that opens and closes the landing entrance.

3.46 DOOR, LOCKING DEVICE, LANDING

A device which secures a landing door in the closed position unless the car is stopped at that landing and the unlocking of which is controlled by the position of the lift car.

3.47 DOOR LOCK, ELECTRO-MECHANICAL

A combination in one unit of a door contact with a door locking device.

3.48 DOOR, MANUALLY OPERATED

A door which is opened and closed solely by hand.

3.49 DOOR, POWER OPERATED

A door which is opened and/or closed by motive power other than hand power.



3.50 DOOR, SELF-CLOSING

A door which is opened manually and which closes automatically when released.

3.51 DRUM OR SHEAVE DIAMETER

The 'diameter' of a drum, sheave or pulley, shall mean the centre to centre measurement of the rope wound on it.

3.52 EMERGENCY STOP BUTTON

A push-button (spring return) designed to open the control circuit and so cause the lift car to stop when the button is pressed. The contacts reclose when pressure is released from the button.

3.53 FIRE - RESISTANCE RATING

The measured time in hours or fractions thereof that the material or construction will withstand fire exposure as determined by fire tests conducted in conformity to recognized standards.

3.54 FIRE - RESISTIVE CONSTRUCTION

A method of construction which prevents or retards the passage of hot gases or flames as defined by the fire resistance rating.

3.55 GOVERNOR, SPEED

An automatic device which brings a lift car or counterweight to rest by operating the safety gear in the event of the speed exceeding a predetermined limit.

3.56 GUIDES

The rails by which the car and counterweight are kept true in their motion.

3.57 GUIDE BRACKET

A member attached to the building or structure and to which the guides are fixed.

3.58 GUIDE SHOES OR ROLLERS

Attachments to the car frame and counterweight by which they are continuously aligned with the guides.

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3.59 INCHING DEVICE, MANUAL

A mechanism which, when controlled by the operator by means of up and down continuous pressure switches, will move the car within the inching zone towards the landing, but not away from it.

3.60 INSTALLATION

A complete lift including its liftwell, liftwell enclosure and related construction and all machinery and equipment necessary for its operation.

3.61 LANDING

That portion of a floor, balcony or platform used to receive and discharge passengers and/or goods.

3.62 LANDING, BOTTOM

The lowest terminal landing.

3.63 LANDING, BUTTON

A switch operated by a push button or other manual device located at a landing for the purpose of calling the lift car to that landing.

3.64 LANDING, TOP

The highest terminal landing.

3.65 LANDING ZONE

A zone extending above and below a landing by a specified distance.

3.66 LEVELLING DEVICE, CAR

Any mechanism which will move the car, at a reduced speed, within the levelling zone towards the landing only, and stop it automatically at the landing.

3.67 LEVELLING ZONE

The limiting distance above or below a landing within which the levelling device may cause movement of the car towards the landing.

3.68 LIFT

Means an appliance used for raising and lowering persons or goods by means of a car or platform the movement of which in a vertical or approximately vertical direction is maintained by guides; and includes the supports, well, enclosures, car, and the whole of the mechanical and electrical apparatus required in connection with the operation and safety of a lift.

3.69 LIFT, ELECTRIC

A lift the machinery of which is driven by an electric motor.

3.70 LIFT, GOODS

A lift designed primarily for the carriage of goods.

3.71 LIFT, PASSENGER

A lift designed primarily for carrying passengers.

3.72 LIFT, POWER

A lift in which the motion of the car is obtained through the application of any form of energy other than manual energy and/or gravitational force.

3.73 LIFT, OVERSLUNG

Refer car frame, overslung 3.28.

3.74 LIFT, UNDERSLUNG

Refer car frame, underslung 3.29.

3.75 LIFTWELL

The enclosed space in which one or more lift cars travel, including the pit and the overhead space for top clearance.

3.76 LIFTWELL, EMERGENCY ACCESS DOOR

An access door provided in the liftwell enclosure for emergency or maintenance purposes and which is distinct from the normal landing doors.

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3.77 LIFTWELL ENCLOSURE

Any structure which separates the liftwell from its surroundings.

3.78 LIFTWELL, MULTIPLE

A liftwell for more than one lift.

3.79 LIFTWELL, SINGLE

A liftwell for a single lift.

3.80 MACHINE, DRIVING

The power unit which applies the energy necessary to raise and lower the car.

3.81 MACHINE, DRUM

A driving machine in which the hoist ropes are fastened to and wind on a drum.

3.82 MACHINE, ELECTRIC

A driving machine in which the energy is applied by an electric motor. It includes the motor and brake, the driving sheave or drum together with its connecting gearing.

3.83 MACHINE, GEARED

A driving machine in which power is transmitted to the sheave or drum through intermediate reduction gearing.

3.84 MACHINE, GEARLESS

A driving machine in which power is transmitted to the driving sheave from the motor without intermediate reduction gearing.

3.85 MACHINE, TRACTION

A driving machine in which the motion of the car is obtained through friction between the hoist ropes and the sheave.

3.86 MACHINE ROOM

The enclosed space used to house the driving machinery and control gear of a lift.

3.87 OPERATING DEVICE

A car switch, push-button, wheel, lever or other device employed to actuate the control equipment.

3.88 OPERATION

The method of actuating the control equipment.

3.89 OPERATION, CAR SWITCH (ATTENDANT CONTROLLED)

A method of operation by which the movement of the lift car is directly under the control of an attendant.

3.90 OPERATION, DUAL (PASSENGER AND ATTENDANT CONTROLLED)

A method of operation which can be switched to provide for either passenger control or attendant control.

3.91 OVERHEAD STRUCTURE

All the structural members, platforms, etc., supporting the lift machinery, sheaves and equipment at the top of the liftwell.

3.92 PASSENGER

A person other than an attendant who is carried by a passenger lift.

3.93 PASSENGER CONTROLLED LIFT

A lift in which the operation is designed to be under the control of a person other than an attendant.

3.94 PIT

The space in the liftwell below the level of the bottom landing sill.

3.95 PLATFORM

The structure which forms the floor of the car and which directly supports the load.

3.96 POSITION INDICATOR

A device situated at the lift landings and/or in the car, which indicates the position of the car in the liftwell.

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3.97 RATED LOAD

The load which the lift is designed to carry.

3.98 RATED SPEED

The speed at which the equipment is designed to operate.

3.99 REGISTERED ENGINEER

An engineer who is registered under the Engineers Registration Act, 1924 and holds a current annual practising certificate.

3.100 RELAY

An electro-magnetically operated switch for making or breaking a control or auxiliary circuit.

3.101 RE-OPENING DEVICE

Is a device which when actuated causes power-operated doors to stop closing and fully re-open.

3.102 RETIRING CAM

A lock operating cam, usually attached to the car and arranged to retract automatically from its operating position.

3.103 SAFETY GEAR

A mechanical device attached to the car frame or to the counterweight, to stop and hold the car or counterweight to the guides, in case of predetermined overspeed or free fall.

3.104 SECONDARY FLOOR

That floor immediately below the machine room floor and used to house sheaves and/or auxiliary equipment.

3.105 SHALL AND SHOULD

The word 'shall' is to be understood as mandatory, and the word 'should' as advisory.

3.106 SLING MEMBERS

The vertical members of a car frame connecting the bow and buffer members.

| 3.107      SWITCH, DERAILMENT

A device actuated by the derailment of the counterweight at any point in the liftwell to provide information to the control that the counterweight has left its guides.

| 3.108      SWITCH, FINAL LIMIT

An emergency switch operated by the movement of the car, to stop the lift by causing the power to be removed from the lift motor and brake, in the event of the car travelling a predetermined distance beyond a terminal landing.

| 3.109      SWITCH, SLACK ROPE

A switch or combination of switches arranged to stop the lift if any of the hoist ropes slacken by a predetermined amount.

| 3.110      TELARC

The testing Laboratory Registration Council of New Zealand established under the Testing Laboratory Registration Act, 1972.

| 3.111      TELARC, APPROVED SIGNATORY

An officer approved by the Telarc Council, to sign test documents bearing the Council's endorsement.

| 3.112      TRAVEL

The vertical distance between the top and bottom landings serviced by the lift.

## SECTION 4 - MATERIALS AND METHODS OF CONSTRUCTION

### 4.1 GENERAL

4.1.1 Materials Conforming to Approved National Standard Specifications. Where a material is nominated for use in the construction of a lift installation, it shall comply with all the appropriate requirements of one of the standards listed in rules 4.2, 4.3, 4.4 and 4.5.

4.1.2 Materials Not Conforming to Approved National Standard Specifications. Where consideration is being given to the use, in the construction of a lift installation, of a material for which no standard specification exists, then the material shall be fully tested to show that it fully meets the requirements of one of the standards listed in rules 4.2, 4.3, 4.4 and 4.5.

### 4.2 STEEL (OTHER THAN CASTINGS)

4.2.1 Structural Steel Sections and Plates. Steel used in the construction of a lift installation shall comply with one of the following standards.

AS 1163	Welded and Seamless Steel Hollow Sections for General Structural Purposes.
AS 1204	Structural Steels - Ordinary Weldable Grades.
AS 1205	Structural Steels - Weather Resistant Weldable Steels.
AS 1405	Low and Intermediate Tensile Strength Carbon Steel Plates of Structural Quality.
BS 4	Structural Steel Sections Part 1 Hot Rolled Sections Part 2 Hot Rolled Hollow Sections
BS 4360:1972	Weldable structural steels.

4.2.2 Forgings. Steel forgings shall comply with

AS G 30	Carbon Steel Forgings for General Engineering Purposes.
BS 29	Carbon Steel Forgings for Shipbuilding and General Engineering Purposes.



## 4.2.3 Rivets. Steel rivets shall comply with

AS G5	Hot Forged Steel Rivets
AS G6	Cold-Forged Steel Rivets

NOTE: The form and dimensions of these rivets shall comply with AS A34 Dimensions of Rivets from  $\frac{1}{4}$  inch to 1  $\frac{3}{4}$  inch Diameter.

AS B118	Dimensions of Small Rivets for General Purposes.
BS 4620	Rivets for General Engineering Purposes.

## 4.2.4 Studs, Bolts, Nuts and Washers.

## 4.2.4.1 Materials. Steel for studs, bolts, nuts and washers shall comply with one of the following standards.

AS 1252	General Grade High Strength Bolts with Associated Nuts and Washers for Structural Engineering (I.S.O. Metric Series).
AS 1442	Hot-Rolled Carbon Steels and Carbon Manganese Steels (Bars and Semi-finished Products).
AS 1443	Bright Carbon Steel and Carbon Steel Bars.
AS G18	Wrought Alloy Steels of the BS 970 En Series Type.
BS 916	Black Bolts, Screws and Nuts.

NOTE: Studs, Bolts and Nuts complying with other British Standards may be used where appropriate for use in lift installations.

## 4.2.4.2 Dimensions. The dimensions of studs, bolts, nuts and washers shall conform with the following standards.

AS 1110	ISO Metric Hexagon Precision Bolts and Screws.
AS 1111	ISO Metric Hexagon Commercial Bolts and Studs.
AS 1112	ISO Metric Hexagon Nuts, Including Thin Nuts, Slotted nuts and Castle Nuts.

AS 1237	Flat Metal Washers for General Engineering Purposes.
AS 1252	General Grade High-Strength Steel Bolts with Associated Nuts and Washers for Structural Engineering (ISO Metric Series).
AS 1427	ISO Metric Machine Screws

NOTE: See Notes for rule 4.2.4.1.

#### 4.3 CASTINGS

4.3.1 Steel Castings. Carbon steel castings shall comply with.

AS G22	Steel Castings for General Engineering Purposes.
BS 3100	Steel Castings for General Engineering Purposes.

4.3.2 Grey Iron Castings. Grey iron castings shall comply with the following standards.

AS G8	Grey Iron Castings
BS 1452	Grey Iron Castings

4.3.3 Malleable Castings. Malleable iron castings shall comply with the following standards.

AS G11	Whiteheart Malleable Iron Castings
AS G12	Blackheart Malleable Iron Castings
AS G14	Pearlitic Malleable Iron Castings
BS 309	Whiteheart Malleable Iron Castings
BS 310	Blackheart Malleable Iron Castings
BS 3333	Pearlitic Malleable Iron Castings

4.3.4 Spheroidal or Nodular Graphite Iron Castings. Iron castings with spheroidal or nodular graphite shall comply with.

AS G9	Iron Castings with Spheroidal or Nodular Graphite.
BS 2789	Iron Castings with Spheroidal or Nodular Graphite.

In designing components to be made of spheroidal or nodular graphite cast iron and subject to shock stress, account shall be taken of the fact that the nominal impact strength of spheroidal graphite iron is only one-third of that of cast mild steel; in particular the design and machining of components shall be such as will avoid excessive stress concentrations or notch effects in any region.

4.4 TIMBER

Timber shall not be used for any of the structural parts.

Small amounts of timber for fixing, packing, and for architraves are acceptable where permitted by the local building bylaws.

4.5 CONCRETE

All cement or concrete shall comply with the appropriate requirements of the relevant New Zealand Standards.

4.6 WELDING

All welding used in the construction of lift installations shall comply with NZS4701 - Metal Arc Welding of Steel Structures.

All structural welding shall be carried out by welders who have passed the relevant tests specified in NZS 4711 - Qualification Tests for Metal-Arc Welders.