

# MECHANICAL INSTALLATIONS FOR ACCESS

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## **APPROVED DOCUMENT**

### **D2: MECHANICAL INSTALLATIONS FOR ACCESS**

#### **STATUS OF APPROVED DOCUMENTS**

Approved Documents are prepared by the Building Industry Authority in accordance with section 49 of the Building Act 1991. They are non-mandatory guidance documents offering only one method of compliance with specific performance criteria of the New Zealand Building Code.

Users should make themselves familiar with the preface to the New Zealand Building Code Handbook, which describes the status of Approved Documents and explains alternative methods of achieving compliance.

Classified uses and defined words which are italicised in the text are explained in clauses A1 and A2 of the New Zealand Building Code.

For document history, see page ii

<b>D2</b>	<b>Date</b>	<b>Alterations</b>	
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Amendment 2	19 August 1994	pp. i and ii, Document history p. vii, Contents p. viii, References p. 3, 1.0.1, 1.0.3, Rule 2.2 p. 5, Rule 14.5 p. 6, 24.18	p. 7, Rules 25.5, 25.6.1, 25.6.2(b)(c), 25.7, 25.7.1, 25.7.2 (a)(b)(c)(d)(g) p. 8 Rule 34.2.3.3(a) p. 8A, 3.0.1 Rule 71.5.4, Figure 1
Reprinted incorporating Amendments 1 and 2	October 1994		
Amendment 3	1 December 1995	p. ii, Document history p. vii, Contents	p. 3, 1.0.1, 1.0.2, 1.0.3 deleted, 2.0 completely revised pp. 4 to 8A deleted
Reprinted incorporating Amendments 1, 2 and 3	April 1996		
Amendment 4	28 February 1998	p. viii, References	p. 3, 1.0.1 revised, 1.0.2 and 2.0 deleted

**DOCUMENT STATUS**

This document, including Amendments 1, 2, 3 and 4, is approved by the Building Industry Authority. It is effective from 28 February 1998 and supersedes all previous versions of this document.

## NZBC Clause D2 MECHANICAL INSTALLATIONS FOR ACCESS

This Clause is extracted from the New Zealand Building Code contained in the First Schedule of the Building Regulations 1992.

### Provisions

#### OBJECTIVE

**D2.1** The objective of this provision is to:

- (a) Safeguard people from injury and loss of amenity while using mechanical installations for movement into, within and out of *buildings*,
- (b) Safeguard maintenance personnel from injury while servicing mechanical installations for access, and
- (c) Ensure that *people with disabilities* are able to carry out normal activities and processes within *buildings*.

#### FUNCTIONAL REQUIREMENT

**D2.2** Mechanical installations for access into, within and out of *buildings* shall provide for the safe and easy movement of people, and for the safety of maintenance personnel.

#### PERFORMANCE

**D2.3.1** Mechanical installations for access shall:

- (a) Move people safely, and stop and hold as required for the normal use of the installation, for all loads up to and including 25% in excess of the rated load,
- (b) Not produce excessive acceleration or deceleration,
- (c) Be constructed to avoid the likelihood of people falling, tripping, becoming caught, being able to touch or be struck by moving parts, sharp edges or projections, under both normal and reasonably foreseeable abnormal conditions of use,

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Objective D2.1(c) shall apply only to those *buildings* to which section 25 of the Disabled Persons Community Welfare Act 1975 applies.

**Provisions**

- (d) Be constructed to prevent collision between components, or between components and the *building*,
- (e) Have a control system that ensures safe abnormal operation in the event of overloading or failure of any single component, and
- (f) Be capable of being isolated for inspection, testing and maintenance.

**D2.3.2** Mechanical installations for access shall be provided with:

- (a) *Adequate* control over normal use, to ensure people's safety throughout any operation involving starting, stopping or changing the direction of travel,
- (b) Notification of position, where people are fully enclosed and the installation serves more than two levels,
- (c) *Adequate* lighting and ventilation for both normal and emergency use, and
- (d) Signs as required by Clause F8 "Signs".

**D2.3.3** Mechanical installations for access shall, for emergency purposes, be provided with a means of:

- (a) Calling outside help,
- (b) Releasing people safely,
- (c) Safeguarding people from exposure to *hazardous* situations, and
- (d) Allowing authorised personnel to override the normal running procedure and take exclusive control of the installation.

**D2.3.4** Potentially dangerous equipment shall be located in spaces which:

- (a) Are secure from unauthorised entry and contain only equipment associated with the installation,
- (b) Are appropriately sized and suitably guarded to provide *adequate*, safe working areas for maintenance personnel,

**Limits on application**

Performance D2.3.3 (d) shall not apply to installations travelling less than 15 m vertically.

**Provisions**

- (c) Are provided with *adequate* power and lighting for maintenance, and
- (d) Have an environment that ensures the safe operation of the equipment under all likely conditions of use.

**D2.3.5** Mechanical installations on *accessible routes* shall:

- (a) Where the passenger conveyor is manually controlled, provide:
  - (i) controls which are easily identifiable and easy to use,
  - (ii) *adequate* notification that the passenger conveyor has registered a summoning call, and
  - (iii) *adequate* notification that the passenger conveyor has arrived, and of its future direction of travel,
- (b) Where the passenger conveyor is fully enclosed and serves more than two levels, provide an *adequate* means of informing occupants of their location,
- (c) Where appropriate, have doors which:
  - (i) are power operated,
  - (ii) are readily distinguishable from their surroundings, and
  - (iii) where automatic, remain open sufficiently long to enable *people with disabilities* to pass through, and
- (d) Have *handrails* within the passenger conveyor.

**Limits on application**

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## REFERENCES

Amd 1  
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For the purposes of New Zealand Building Code compliance, acceptable reference documents include only the quoted edition and specific amendments as listed below.

Amds 2  
and 4

### Standards New Zealand

NZS 4332:1997 Non-domestic passenger and goods lifts

### Where quoted

AS1 1.0.1

### New Zealand Government Departments

#### Ministry of Transport

1985 Rules for power lifts not exceeding 750 watts (one horsepower).

AS2 1.0.1

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1989 Power Lift Rules.

AS2 2.0.1  
(Rule 1.2)

### The European Committee for Standardisation. Brussels

EN115:1983 Safety rules for the construction and installation of escalators and passenger conveyors.

AS3 1.0.1

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## DEFINITIONS

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This is an abbreviated list of definitions for words or terms particularly relevant to this Approved Document. The definitions for any other italicised words may be found in the New Zealand Building Code Handbook.

**Accessible** Having features to permit use by *people with disabilities*.

**Accessible route** An *access route* usable by *people with disabilities*. It shall be a continuous route that can be negotiated unaided by a wheelchair user. The route shall extend from street boundary or carparking area to those spaces within the *building* required to be *accessible* to enable *people with disabilities* to carry out normal activities and processes within the *building*.

**Adequate** *Adequate* to achieve the objectives of the *building code*.

**Amenity** An attribute of a *building* which contributes to the health, physical independence, and well being of the *building's* users but which is not associated with disease or a specific illness.

**Building** has the meaning ascribed to it by the Building Act 1991.

**Building element** Any structural and non-structural component or assembly incorporated into or associated with a *building*. Included are *fixtures*, services, *drains*, permanent mechanical installations for access, glazing, partitions, ceilings and temporary supports.

**Hazardous** Creating an unreasonable risk to people of bodily injury or deterioration of health.

**People with disabilities** People whose ability to use *buildings* is affected by mental, physical, hearing or sight impairment.

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**VERIFICATION METHOD D2/VM1  
PASSENGER CARRYING LIFTS**

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No specific test methods have been adopted for verifying compliance with the Performance of NZBC D2.

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## **ACCEPTABLE SOLUTION D2/AS1 PASSENGER CARRYING LIFTS**

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### **1.0 REFERENCE DOCUMENT**

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**1.0.1** NZS 4332 is an acceptable solution subject to the following modifications:

- a) Where this Standard has provisions that are in non-specific or unquantified terms (such as where provisions are required to be appropriate, adequate, suitable, equivalent, satisfactory, acceptable, applicable or the like), then these do not form part of the acceptable solution and must be treated as an alternative solution.
- b) Where this Standard requires approval, verification or the like then this must be to the satisfaction of the territorial authority.
- c) The structural design of the building, its elements and the fixings supporting the lift installation, shall comply with Clause B1 "Structure" and is outside the scope of this Standard as an acceptable solution. Structural design of parts of the lift installation where described in this Standard shall be undertaken by a suitably qualified designer and shall be to the approval of the territorial authority.
- d) In Clause 70.2 replace the words "1400 mm deep x 1350 mm wide" with "1400 mm x 1400 mm".

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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, 4.5, 4.6 and 4.7 (See Rule 2.3.2)".

**Rule 4.5.1** To read:

"4.5.1 Structural Concrete. All concrete shall comply with NZS 3109".

**Rule 4.7.1** Delete the words:

"or an equivalent national glazing standard. Other glass used shall comply with the local building by-laws."

**Rule 5.2** Heading to read:

"5.2 Electric Lift Particulars to be Submitted".

**Rule 6.2.3** Delete the words:

"NZS 3103P Code of practice for reinforced concrete design".

**Rule 6.3** Delete.

**Rule 7.1** To read:

"Machine rooms shall be enclosed spaces independent of other areas in the *building*. The enclosure shall be pierced only to the extent necessary for the running clearances required by the lift equipment and for the passage of services.  
*Fire* rating of machine rooms shall comply with the requirements of NZBC C3".

**Rule 7.4.1** To read:

"7.4.1 Doors and locking of machine rooms.

Doors to machine rooms shall be provided with a night type latch that can be opened from without only by the use of a key and shall not require a key to open it from within the machine room.

If the access to the machine room is by way of an area containing other machinery or equipment associated with the operation of the *building*, the machine room door shall be of the self closing and self locking type".

**Rule 7.4.2** To read:

"7.4.2 Restrictions to Persons Entering Machine Rooms.

The entering of machine rooms shall be restricted to authorized persons".

**Rule 7.5** To read:

"7.5 Means of Access to Machine Rooms.

Access to machine rooms shall comply with NZBC D1. Barriers in accessways shall comply with NZBC F4".

**7.7.2** Third paragraph to read:

"There shall be sufficient access to permit removal and replacement of the thrust bearing of a geared machine".

Notes 1, 2 and 3 to be relabelled as Rules 7.7.3, 7.7.4 and 7.7.5 respectively.

**Rule 7.9** First paragraph. To read:

"Hatches shall be provided in the floor or wall of a lift machine room above its associated liftwell, to permit the removal of machinery for maintenance and/or replacement".

**Rule 7.9 (a)** First paragraph. To read:

"covers shall be hinged whenever practicable".

Third paragraph. Delete.

**Rule 7.9 (f)** Add the words:

"Guarding shall comply with NZBC F4".

**Rule 7.11** To read:

"Access inside machine rooms shall comply with NZBC D1".

**Rule 7.13.1.3** Delete the words:

"or other approved access means,"

**Rule 7.13.2** Last sentence. To read:

"it shall be suitably guarded by barriers complying with NZBC F4".

**Rule 7.13.3** Second paragraph. To read:

"Fixed rung-type ladders may be used provided:

- (a) A clear space of 600 mm exists between the foot of the ladder and any equipment.
- (b) No obstruction shall be within 760 mm of the foot of a ladder inclined at 75 degrees, increasing proportionally to 960 mm for a ladder inclined at 65 degrees.

- (c) Where equipment is installed in close proximity to the foot of the ladder, the emergency stop switch for such equipment shall be located adjacent to the foot of the ladder. In all cases, stop switches shall be located in a readily accessible position.

Last paragraph. To read:  
"Where major items of equipment such as motor-generator sets and floor selectors are installed in a secondary floor space, that space shall be provided with access that allows the equipment to be removed or replaced without manhandling. A machinery hatch complying with Rule 7.9, plus a suitable lifting device is acceptable.

**Rule 7.18** To read:

"A beam or beams shall be provided for lifting of machine parts, with at least one beam over a hatchway in the floor, or running up to a hatchway in the wall of the machine room".

**Rule 11.5.2 (a)** To read:

"The doorway opening shall have a clear height of no less than 1965 mm".

**Rule 11.5.3** Replace the words "Rule 11.5.3.1 or 11.5.3.2" with "NZBC D1".

**Rule 11.5.3.1** To read:

"11.5.3.1 Ladder Mounted on Side of Liftwell (at right angles to sill line). Access ladders which are mounted at right angles to the sill line shall be accessible from the bottom landing of every lift".

**Rule 11.5.3.2** To read:

"11.5.3.2 Ladder Mounted on Front Face of Liftwell (parallel to sill line).

If mounting a ladder to the side of a liftwell would cause the nearest stile to be more than 900 mm from the landing door jamb then the ladder shall be mounted to the front face of the liftwell.

When a ladder is mounted on the front face of the liftwell, the horizontal distance of the ladder stile from the inside edge of the landing door jamb, shall be no more than 750 mm".

**Rule 11.12** Replace the words "within the general guide-lines of AS 1657 SAA Code and to the satisfaction of the inspecting Engineer

Surveyor" with "in accordance with NZBC D1".

**Rule 12.1** Replace the words "the New Zealand Building By-laws" with "NZBC C3".

**Rule 12.3** To read:

"Liftwell Ventilation. Refer to NZBC C3".

**Rule 12.6.2** Paragraph (a) Delete the words:

"and a certificate supplied in accordance with Rule 2.6"

Paragraph (c) Delete.

Paragraph (e) Delete.

Paragraph (h). To read:

"In agreement with the owner, instructions are to be drawn up setting out the procedures and safeguards to be observed for the safe cleaning of the glass inside the liftwell. Such instructions shall be displayed at a suitable location for this purpose".

**Rule 13.3.1** Replace the words "the New Zealand Building By-laws" with "NZBC C3".

**Rule 13.7** Replace the words "automatically operated" with "closed automatically".

**Rule 13.7 (a)** To read:

"If power operated they shall close only by the operation of a continuous pressure button".

**Rule 14.5** To read:

**"14.5 Emergency Opening Arrangements for Landing Doors**

For emergency purposes and for purposes of maintenance and inspection, provisions shall be made to open each door from the landing, when the car is not within the particular landing zone. This shall be accomplished with the aid of a key to fit the unlocking triangle as defined in Appendix B of EN 81: Part 1 or such other specially shaped key that is in established use in the country. The key shall be kept in a place of security but be readily available in cases of emergency. (The use of a plain rod or bar for this purpose shall be precluded.)

**Rule 17.5** Add the words:

"Sockets complying with AS 1735.2 shall also be accepted provided they are accompanied by the certification listed in

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BS 463 Clause 16 and tested to the requirements of AS 1735.2 Appendix A1.3 (g)."

**Rule 17.6** Last sentence. Delete.

**Rule 20.12.2** Third paragraph To read:  
"where trimmer beams are used for the support of guide rails they shall be designed for the forces given in this section of the Rules".

**Rule 22.1** Delete the word "preferably".

**Rule 22.10.1 (c)** To read:  
"Additional for goods lifts, no less than one quarter of the static rated load concentrated on the mid point of the sill".

**Rule 22.20.1.1** To read:  
"Underside of car. The underside of every lift car shall be provided with at least one lamp with a minimum output of 750 lumens to afford general illumination. This light shall be controlled by a pull switch situated centrally underneath the car and behind the apron. The pull cord should be long enough to be reached from the landing below that at which the car may be stopped."

**Rule 22.20.1.2.** To read:  
"Top of Car. The top of every car shall be provided with illumination as follows:

(a) If it is capable of illuminating all equipment requiring servicing and inspection on the car roof; a single light with a minimum rated output of 900 lumens.

(b) Where a single fixed light will not give effective illumination as in (a) above, several lights each with a minimum rated output of 750 lumens shall be provided. One of these may be an approved type of hand lamp, permanently connected to a ceiling rose or a connection box with cord clamp, and provided with a suitable reel or cleat to enable the lead and hand lamp to be secured in position.

All switches, ceiling roses, light fittings etc. shall be impact resistant and not susceptible to damage from oil or grease. Control switch or switches for the top of car lights shall be clearly visible from a landing when the roof of the car is substantially level with that landing".

**Rule 22.20.2.7 (c)** To read:

"(c) It shall provide an average of at least 10 lux on the floor of the car, plus sufficient lighting at the telephone and alarm button to enable their effective use."

**Rule 22.24** To read:

"Car walls shall be unperforated to a height of 2200 mm from the floor, except where ventilating apertures are required in accordance with Rule 22.25. Car walls may be of timber or metal or shall comply with Rule 22.18.

**Rule 22.26** Last paragraph. Delete.

**Rule 24.1** Delete.

**Rule 24.2** Delete

**Rule 24.3** Delete.

**Rule 24.4** Delete.

**Rule 24.5** Delete.

**Rule 24.6** Delete.

**Rule 24.8** To read.

"A general purpose power point of an impact-resistant type shall be provided on the top of each lift car."

**Rule 24.9** Delete.

**Rule 24.10** Delete.

**Rule 24.12** Delete.

**Rule 24.13** Delete.

**Rule 24.14** Delete.

**Rule 24.15** Delete.

**Rule 24.16** Delete.

**Rule 24.17** Delete.

**Rule 24.18** To read:

**"24.18 Electrical Supply**

(a) The supply of electricity shall be by a submain or subcircuit that is taken from the main switchboard of the building and is dedicated exclusively to the lift installation.

(b) The main switch on any switchboard to which a lift is connected and all switches controlling lift supply sub-mains shall be clearly and legibly marked "THIS SWITCH SUPPLIES A LIFT".

(c) The supply of electricity to a lift (apart from the secondary lighting supply as prescribed in Rule 22.20.2.1) shall not be interrupted automatically by a fire alarm system."

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**Rule 24.19** To read:

"When the distance between any two consecutive landings of a lift exceeds 10 metres, any lift to which the public has access, shall be supplied with emergency power for lift operation (from a standby generator in addition to its normal electrical supply), or it shall be equipped with an automatic rescue device.

This requirement does not apply to hydraulic lifts which comply with Rule 36.6."

**Rule 24.22** To read:

"The following general requirements shall be observed in the installation of electrical wiring:

- (a) Wiring, cables, trunking, etc. shall not be laid on the floor in access ways (refer to Rule 7.7.3). It may be laid in the floor (see Rule 7.7.4(d)) or against the wall, or at a height of 2 metres above the floor of the machine room, provided access ways are not obstructed.
- (b) Where trunking is laid in the floor, covers shall be a robust and non-slip type, and shall be flush within 3 mm of floor level.
- (c) All wiring shall comply with NZBC G9."

**Rule 24.23** Delete.

**Rule 24.24.4** Delete.

**Rule 24.26** Delete.

**Rule 25.5** To read:

**"25.5 Car Control Buttons**

The level of the building's final exit shall be indicated by a raised or indented star symbol placed alongside the car control button. Where a building has more than one final exit level, all such levels shall be indicated. These symbols shall be at least 15 mm high and be as shown on Figure 1."

**Rule 25.6.1** Second paragraph. Replace the words "exceeding 15 metres" with the words "of 15 metres or more."

**Rule 25.6.2 (a)** Second paragraph. Amend by adding after "master key", the words: "compatible with the existing national pattern."

**Rule 25.6.2(b)** Delete the first paragraph.

**Rule 25.6.2(c)** Replace the words "sub-rules (a) or (b)" with the words "sub-rule (a)".

**Rule 25.7** To read:

**"25.7 Detection of fire in machine rooms (including sheave rooms and governor rooms containing electronic equipment) and liftwells."**

**Rule 25.7.1** To read:

"25.7.1 Application. This rule shall apply to all lifts with a travel exceeding two levels and to all lifts installed in buildings where the machine rooms and/or liftwells are protected by an automatic fire sprinkler system (see rules 7.2 and 12.5).

This rule shall also apply to lifts in buildings where sprinkler systems are added at a date later than the initial installation of the lift."

**Rule 25.7.2(a)** To read:

"(a) A system for detecting excessive temperatures, and consisting of a number of excessive temperature switches, shall be fitted in the machine room and liftwell.

**Rule 25.7.2(b)** To read:

"(b) Excessive temperature switches:

- (i) in the machine room shall operate at a temperature of 45 °C, or 11 °C below the operating temperature of any sprinkler head fitted, whichever is the lower.
- (ii) in the liftwell shall operate at a temperature of 75 °C, or 11 °C below the operating temperature of any sprinkler head fitted, whichever is the lower.
- (iii) shall be installed within 300 mm radius of each sprinkler head and heat detector forming part of the building fire alarm system. Where sprinkler heads or heat detectors are not fitted, excessive temperature switches shall be located in accordance with the requirements of NZS 4512 for positioning heat detectors."

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**Rule 25.7.2(c)** To read:

"(c) Sprinkler heads, heat detector sensors and excessive temperature switches shall be protected from accidental damage by approved guards."

**Rule 25.7.2(d)** To read:

"(d) Operation of an excessive temperature switch shall take all lifts, except those operating on inspection service, non-stop to the main floor and then render them inoperative with the doors open."

**Rule 25.7.2(g)** To read:

"(g) The excessive temperature switches shall be fixed temperature heat actuated fire detectors complying with NZS 2139, constructed and installed for operation at extra low voltage. The definition of "extra low voltage" as given in The Electricity Regulations 1993 means "any voltage normally not exceeding 32 volts a.c. or 115 volts d.c."

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**Rule 25.8** Delete.

**Rule 26.1.17** Delete.

**Rule 26.6** Replace the words "may be used to" with "shall".

**Rule 26.7 (c)** Replace the word "marked" with "indicated".

**Rule 28.1** Delete.

**Rule 28.3.2 (a)** Delete the words:  
"or similar device".

**Rule 28.3.4** Second paragraph to read:

"Automatically recharged batteries shall have sufficient capacity for 2 hours operation of the system. The batteries shall be automatically recharged within not more than 45 minutes of each 15 minutes of use."

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**Rule 29.1** Second sentence to read:

"The safety gear shall be attached to the car frame".

**Rule 31.1** Delete the words:  
"New Zealand".

**Rule 31.6** Replace the words "a registered" with "an appropriately qualified and experienced".

**Rule 34.2.3.3 (a)** Replace:

$$"p = 2.3 \left[ 1 - \sqrt{1 - 1600(t/d)^2} \right]"$$

$$\text{with } "p = 2.3 \left[ 1 - \sqrt{1 - 1600(t/d)^2} \right]"$$

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**Rule 57** Delete.

**Rule 61.4 (d) (i)** Delete.

**Rule 69 (a)** Delete.

## 3.0 ADDITIONAL RULES

**3.0.1** The reference document shall have the following rules added.

**Rule 7.4.3**

7.4.3 Signs. Machine rooms shall be identified according to NZBC F8.

**Rule 26.1.21**

"26.1.21 Behaviour in Earth Fault Conditions. The control circuit shall be so arranged that the lift will be inoperative in the event of an earth fault occurring in the circuit of door locks or other safety devices."

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## SECTION 71 - REQUIREMENTS FOR LIFTS ON ACCESS ROUTES FOR PEOPLE WITH DISABILITIES

**71.1 Levelling**

Under all conditions of loading the levelling accuracy of the lift car shall be  $\pm 20$  mm.

**71.2 Lift car size**

The minimum interior dimensions of the lift car shall be 1400 x 1400 mm.

**71.3 Car and landing doors**

Car and landing doors shall be power operated and fitted with passenger protective devices and delayed closing complying with Rule 23.6.1. The doors shall remain open for at least 5 seconds before they start to close.

**Comment:**

*The time necessary for the doors to stay fully open to safeguard people with disabilities depends on a number of factors including:*

- notification method of lift arrival.
- distance from call button to the lift.
- number and configuration of lifts.
- type of passenger protective devices.

*Alternative solutions with different delay times may be acceptable, provided it can be demonstrated that people with disabilities have sufficient time to move into the lift car without being struck by the closing doors.*

**71.3.2** The doors shall provide a minimum opening width of 900 mm.

**71.3.3** The doors shall be clearly colour contrasted with their surroundings.

**71.4 Lift controls**

**71.4.1** All controls shall be located within a height of 900 mm and 1500 mm from the floor level. An

acceptable layout for a control panel inside the lift car is shown in Figure 1.

**71.4.2** Call and control buttons shall have:

- (a) A positive movement on actuation, and
- (b) A width or diameter of at least 20 mm.

**71.4.3** Control buttons shall have raised or indented designations immediately to the left of the button. These designations shall be as shown on Figure 1 and shall be at least 15 mm high.

**71.4.4** Call buttons shall have a tactile distinction from the wall or faceplate in which they are positioned.

**71.5 Lift indicators**

**71.5.1** Each landing shall have:

- (a) A 'lift coming' or 'call accepted' indicator, and
- (b) Audible and visual signals notifying the arrival of the lift and its direction of travel.

**71.5.2** An acceptable audible signal is two gongs for downward travel and one gong for upward travel. An acceptable visual signal is an illuminated arrow.

**71.5.3** Inside the lift car a position indicator shall be fitted in a location easily read by passengers facing the main doorway.

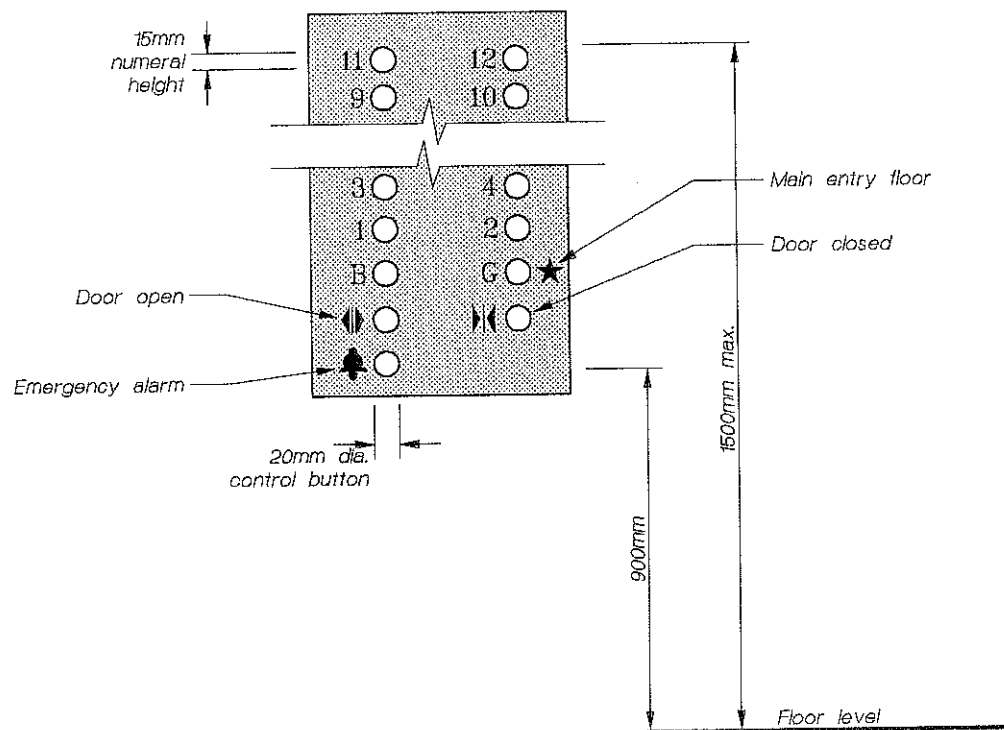
**71.5.4** Except where audible notification is given, raised, tactile numbers shall be provided on the leading edge of the landing doors, or if this is not possible, on the entrance architrave as close as practicable to the landing doors, to advise of floor level. These numbers shall be positioned between 900 mm and 1500 mm above floor level and be at least 20 mm high.

**71.6 Handrails**

**71.6.1** Handrails shall be provided on all walls except those with doors. The handrails shall comply with D1/AS1, Paragraph 6.0.

Amd 2  
Aug '94

**Figure 1: Control panel for passenger carrying lifts**  
Paragraph 2.0 (Rule 71.4)



Amd 2  
Aug '94

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**VERIFICATION METHOD D2/VM2  
DOMESTIC AND SERVICE LIFTS**

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No specific test methods have been adopted for verifying compliance with the Performance of NZBC D2.

## ACCEPTABLE SOLUTION D2/AS2 DOMESTIC AND SERVICE LIFTS

### 1.0 REFERENCE DOCUMENT

**1.0.1** The "Rules for power lifts not exceeding 750 watts (one horsepower)" is an acceptable solution when modified as shown in Paragraphs 2.0 and 3.0.

**1.0.2** Rules 3.2(b) and 3.3 contain information on the design of *buildings* to cater for the loadings associated with the lift installation. The design should be undertaken by a person, who on the basis of experience or qualifications, is competent to design *buildings* and *building elements*.

**1.0.3** This acceptable solution does not extend to the inclusion of approvals, waivers, dispensations or discretionary powers exercised by the Engineer Surveyor as contained in Rules 1.4 and 1.6.

### 2.0 MODIFIED RULES

**2.0.1** Modifications are shown against the appropriate rule number of the reference document.

**Title to read:**

"Mechanical installations for access, domestic and service lifts. An acceptable solution for NZBC D2".

**Rule 1.1.** To read:

"These rules shall apply to the design, construction, maintenance, inspection testing and operation, of passenger lifts serving individual private dwellings to which the public does not have access, and to service lifts which are for the carriage of goods only"

**Rule 1.2.** First paragraph to read:

"All lifts coming within the scope of these rules shall be constructed to satisfy the standard and quality of materials and workmanship required by the "Power Lift Rules". The manufacturer is responsible for ensuring compliance with these requirements".

Second paragraph, replace the words:

"Engineer Surveyors may check such equipment" with "Authorised inspectors shall check all new lifts after installation and prior to use. Further checks shall be undertaken ...".

**Rule 1.4** Delete the words:

"if required by an Engineer Surveyor appointed under the Boilers, Lifts and Cranes Act 1950".

**Rule 1.7** Add at end of Rule:

"Refer to NZBC F8: 'Signs' ".

**Rule 2.5** To read:

"Car top clearance.  
The distance between the roof of the lift car and the first point of obstruction when the car is standing at floor level at the upper terminal landing".

**Rule 2.6** To read:

"Car top runby.  
The distance the lift car can travel beyond the upper terminal floor. For lifts with counterweight, the distance shall be determined when the counterweight is landed on fully compressed buffers".

**Rule 3.2. (e)** To read:

"Safe and convenient access to the machinery space shall be provided in accordance with NZBC D1 'Access Routes'. Barriers shall comply with NZBC F4 'Safety from falling' ".

**Rule 3.2 (f)** Replace last sentence with:

"The owner shall be responsible for displaying an appropriate sign - refer to NZBC F8 'Signs'".

**Rule 4.1.2. (c) (i)** Delete the words:

"above the car roof".

**Rule 4.1.2 (c) (ii)** Replace the words:

"above the projection" with "plus the projection".

**Rule 4.1.3 (a)** To read:

"car top runby plus 0.75 metres."

**Rule 4.1.3. (b)** To read:

"car top runby plus the projection of any part of the car or its equipment above the car top plus 150 mm".

**Rule 4.3.3** To read:

"The average reaction (R) exerted by a buffer on its supports is given by:

$$R = M \left( g + \frac{V^2}{2S} \right) \text{ (N)}$$

where

M = mass of car plus contract load (kg)

V = speed of car (m/s) at impact (1.15 times the rated speed)

S = buffer stroke (m)

g = 9.81 m/s<sup>2</sup>

For the purposes of design of the buffer supports the maximum reaction force shall be taken as twice the average value (R) for spring buffers."

**Rule 4.4 (a)** To read:

"Every lift pit shall be founded on solid earth unless the pit floor is specifically designed. The pit shall extend over the entire area of the lift well".

**Rule 9.2 (b)** Delete first sentence.

**Rule 12.2(a)** Replace the last paragraph with:

"The maximum load shall not exceed that obtained by the formula:

$$P_e = \frac{4.085 E I}{L^2 \times 10^2}$$

where

P<sub>e</sub> = maximum load (N)

E = modulus of elasticity (MPa).

I = moment of inertia of ram (cm<sup>4</sup>)

L = maximum exposed length of ram (m)".

**Rule 12.2 (g)** fifth paragraph. Replace the words:

"A removal cover to the tank" with "A removable cover for the tank:".

**Rule 12.6 (a)** last sentence. Replace the words:

"system which they form part" with "system of which they form part".

**Rule 13.2** Add at end of Rule

"Refer to NZBC F8 'Signs'".

**Rule 13.4.2 (c)** Replace the words:

"75 mm above" with "75 mm plus".

**Rule 13.4.3 (a).** To read:

"0.5 metres plus car top runby".

**Rule 13.4.3 (b).** Add to end of sentence:

"plus car top runby".

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### 3.0 ADDITIONAL RULES

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**3.0.1** The reference document shall have the following new rules added.

**Rule 4.1.1** Add the following words:

This clear height shall be provided over a minimum clear area of 900 mm x 600 mm except that where the available height is greater than 750 mm, this may be reduced to 600 mm x 600 mm.

It is acceptable for an obstruction, such as a ram or buffer, to impinge on the minimum clear area provided there is a horizontal clearance of at least 450 mm on three sides of the obstruction.

**Rule 4.1.5** Minimum area at top of lift car for the safety of maintenance personnel:

The clear height required by Rule 4.1.2 or 4.1.3 shall be provided over a minimum clear area of 900 mm x 600 mm except that where the available height is greater than 750 mm, this may be reduced to 600 mm x 600 mm.

**Rule 13.4.5** Clearances and safety for maintenance personnel:

Clearances at the top and the bottom of the car need not be provided for service lifts.

Provision shall be made to prevent trapping of maintenance personnel under the lift car. This shall be provided by a manually positioned prop, or other equally effective device, capable of holding the lift car with its contract load, in a raised position.

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**VERIFICATION METHOD D2/VM3  
ESCALATORS AND MOVING WALKS**

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No specific test methods have been adopted for verifying compliance with the Performance of NZBC D2.

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## ACCEPTABLE SOLUTION D2/AS3 ESCALATORS AND MOVING WALKS

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### 1.0 REFERENCE DOCUMENT

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**1.0.1** EN115 is approved as an acceptable solution when modified as shown in Paragraphs 2.0 and 3.0.

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### 2.0 MODIFIED RULES

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**2.0.1** Where they occur in the document, the words "passenger conveyor" shall be read as "moving walk".

**2.0.2** Modifications to clauses are shown against the appropriate clause number of the reference document.

**Clause 0.2** Delete.

**Clause 0.3** Delete.

**Clause 0.5.1** To read:

"Escalators and moving walks shall be made of materials that are difficult to ignite".

**Clause 0.5.2** Delete the words:

"or in exceptional cases serve as emergency exits".

**Clause 0.8** Delete.

**Clause 5.2.3** Replace: "2.3 m" with "2.1 m".

Delete the words:

"(competent authority can permit exception)".

**Clause 5.4.2** Delete the words:

"provided national regulations do not impose other values".

**Clause 6.2** To read:

"6.2 Accessibility  
Access routes to machinery spaces shall comply with NZBC D1".

**Clause 6.3.1.3** Delete the words:

"Provided this is not contrary to the national regulations".

**Clause 6.3.1.4** Delete the words:

"Provided national regulations do not impose a higher value".

**Clause 7.3.1** Delete the last sentence.

**Clause 8.1.1** Delete the words:

"If escalators are permitted to be used as emergency exit when out of service, the step height shall not exceed 0.21 m".

**Clause 9.3** Delete.

**Clause 15.1.1** Delete the words:

"(see Figures 6, 7 and 8)"

**Clause 15.1.2.1** To read:

"Refer to NZBC F8 for signs required for escalator and moving walk installations".

**Clause 15.1.2.3** To read:

"Provision shall be made to prevent access to any escalator that is not operating."

**Comment:**

1. *The escalator may not be operating for many reasons including being shut down for emergency, or for repairs, maintenance, testing or inspection.*

2. *Provision to prevent access may take the form of a prominent sign or a barrier or both.*

**Clause 15.1.4** Delete.

**Figures 6, 7 and 8** Delete.

**Clause 16.3.1 (b)** To read:

"a section recording inspection and maintenance procedures as required by the *compliance schedule*."

**Clause 16.3.2** Delete.

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### 3.0 ADDITIONAL RULES

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**3.0.1** The reference document shall have the following rules added.

**Clause 17** Requirements for moving walks on *accessible routes*. (Note: Escalators are not suitable for use by *people with disabilities*).

**Clause 17.1** The maximum slope of a moving walk shall be 1 in 10 (5.7°).

**Clause 17.2** The width of the pallet or tread shall be no less than 800 mm and no greater than 1000 mm.

**Comment:**

*The maximum width between handrails should preferably not exceed 1200 mm.*

**Clause 17.3** The moving walkway shall extend into the landings by at least 800 mm.