

Approved Document for New Zealand Building Code Mechanical Installations for Access Clause D2 Second Edition

Prepared by the Building Industry Authority
This Approved Document is prepared by the Building Industry Authority, which is a statutory body established by the Building Act 1991.



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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.

D2: Document History

	Date	Alterations	
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Amendment 1	September 1993	p. vii, NZS 3109 p. 5, Rule 17.5	p. 7, Rules, 25.7.1, 28.3.4 26.1.21
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
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Second Edition	6 January 2002		

Note:

Page numbers relate to the document at the time of Amendment and may not match page numbers in current document.

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New Zealand Building Code Clause D2

Mechanical Installations for Access

The mandatory provisions for building work are contained in the New Zealand Building Code (NZBC), which comprises the First Schedule to the Building Regulations 1992. The relevant NZBC clause for Mechanical Installations for Access is D2.

FIRST SCHEDULE—*continued*

Clause D2—MECHANICAL INSTALLATIONS FOR ACCESS

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,

Limits on application

Objective D2.1(c) shall apply only to those *buildings* to which section 47A of the Act applies.

FIRST SCHEDULE—continued**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:

Limits on application

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

FIRST SCHEDULE—continued

Provisions	Limits on application
<ul style="list-style-type: none"> (a) Are secure from unauthorised entry and contain only equipment associated with the installation, (b) Are appropriately sized and suitably guarded to provide <i>adequate</i> safe working areas for maintenance personnel, (c) Are provided with <i>adequate</i> 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:	
<ul style="list-style-type: none"> (a) Where the passenger conveyor is manually controlled, provide: <ul style="list-style-type: none"> (i) controls which are easily identifiable and easy to use, (ii) <i>adequate</i> notification that the passenger conveyor has registered a summoning call, and (iii) <i>adequate</i> 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 <i>adequate</i> means of informing occupants of their location, (c) Where appropriate, have doors which: <ul style="list-style-type: none"> (i) are power operated, (ii) are readily distinguishable from their surroundings, and (iii) where automatic, remain open sufficiently long to enable <i>people with disabilities</i> to pass through, and (d) Have <i>handrails</i> within the passenger conveyor. 	

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References

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

		Where quoted
Standards New Zealand		
NZS 4332: 1997	Non-domestic passenger and goods lifts	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
1989	Power lift rules	AS2 2.0.1 (Rule 1.2)
The European Committee for Standardisation, Brussels		
EN 81:-	Safety rules for the construction and installation of lifts	
Part 1: 1998	Electric lifts	AS1 2.0
Part 2: 1998	Hydraulic lifts	AS1 2.0
EN 115: 1983	Safety rules for the construction and installation of escalators and passenger conveyors	AS3 1.0.1

Definitions

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 car parking 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 means any *person* who suffers from physical or mental disability to such a degree that he or she is seriously limited in the extent to which he or she can engage in the activities, pursuits, and the processes of everyday life.

Verification Method D2/VM1

Passenger Carrying Lifts

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

Acceptable Solution D2/AS1

Passenger Carrying Lifts

1.0 Reference Document NZS 4332

1.0.1 NZS 4332 is an acceptable solution subject to the 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".

2.0 Reference Document EN 81 Parts 1 and 2

2.0.1 EN 81: Part 1 (EN 81-1) is an acceptable solution for electric lifts subject to the amendments given in Paragraphs 2.1 and 2.2 below.

2.0.2 EN 81: Part 2 (EN 81-2) is an acceptable solution for hydraulic lifts subject to the amendments given in Paragraphs 2.1 and 2.3 below.

2.1 Amendments to both EN 81-1 and EN 81-2

The amendments comprise additions (given in Paragraph 2.1.1 below) and modifications (given in Paragraph 2.1.2 below).

2.1.1 Add the following new clauses to EN 81-1 and EN 81-2:

Clause 1.5 to read:

"**1.5** The Standard does not cover the following:

1.5.1 Structural Design (NZBC Clause B1)

The structural designs of the lift installation including its various components and of the building housing the installation are outside of the scope of this Standard.

NOTE Although this Standard provides some design criteria and information on the loads resulting from the operation and use of the lift installation, it does not fully account for all loadings that must be taken into consideration, e.g. earthquake. The overall structural design of the lift installation and of its components is therefore outside of the scope of this Standard. Designs need to be undertaken by a suitably qualified designer with proposals approved by the *territorial authority* as part of the *building consent* process.

The structural design of the *building* to withstand the loads imposed on it by the lift installation is also outside of the scope of this Standard. Design proposals here also need to be approved by the *territorial authority* as part of the *building consent* process.

1.5.2 Durability (NZBC Clause B2)

The design of the lift installation with respect to durability is outside of the scope of this Standard.

NOTE This Standard does not specifically address the durability of all components of the lift installation. As part of the *building consent* process the *territorial authority* may require evidence that the various components of the lift installation will meet the *building code's* durability provisions.

1.5.3 Fire (NZBC Clauses C2, C3 and C4)

The design of the lift installation with respect to *fire* is outside of the scope of this Standard.

NOTE The Standard provides some limited information however any *fire* design cannot look at the lift installation in isolation and needs to consider the *building* as a whole before determining requirements.

This Acceptable Solution, by reference to Clause 25.6 of NZS 4332, aims to ensure lifts are not used during a firecall in the *building*. Lifts specifically designed to be used during a *fire* require special engineering consideration and are outside of the scope of this Acceptable Solution and NZS 4332."

Clause 1.6 to read:

"1.6 Requirements from NZS 4332

The lift installation shall meet the requirements of the following clauses from NZS 4332. If there is conflict between these clauses and provisions in EN 81, these clauses shall take precedence:

Clause 2.5 Maintenance and inspection

Clause 7.9 Hatches in machine rooms

Clause 7.15 Protection of machine rooms against weather

Clause 7.17 Ventilation of machine rooms

Clause 7.18 Machine room lifting beams

Clause 11.3 Pit maintenance

Clause 11.4 Guards between adjacent pits

Clause 11.5.3 Access from bottom landing doors

Clause 11.9 Dryness of pits

Clause 22.20.2 Internal lighting

Clause 23.6 Passenger protective device – horizontal doors (see Note)

Clause 24.10 Lift circuit drawing in machine room

Clause 25.6 Operation of lifts under fire or other emergency conditions (excluding earthquakes)

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

Clause 25.8 Operation of lifts under earthquake conditions

Clause 28.2.1 Emergency audible alarm

Clause 70 Requirements for lifts on access routes for people with disabilities

NOTE See also Paragraph 2.1.2 below for amendments to Clauses 7.5.2.1.1.3 and 8.7.2.1.1.3."

Clause 1.7 to read:

"1.7 Interpretation

Where this Standard has provisions that are in non-specific or unquantified terms (such as where provisions are required to be suitable, special, adequate, appropriate, equivalent, satisfactory, acceptable, applicable or the like) then proposals to meet those provisions must be to the satisfaction of the *territorial authority*.

Where the Standard requires that manufacturer's advice be followed, the adequacy of that advice shall be to the satisfaction of the *territorial authority*.

Where this Standard requires approval, verification or the like, then this must be to the satisfaction of the *territorial authority*.

Where *territorial authority* is mentioned in this Acceptable Solution, it shall be taken to include a *building certifier* acting within the scope of its approval.

The word "shall" identifies a mandatory requirement for compliance with this Standard. The word "should" refers to practices which are advised or recommended.

The word "normative" identifies a mandatory requirement for compliance with this Standard.

The words "NOTE" and "informative" identify commentary material. Such material is given for the purposes of general information and does not form part of the mandatory requirements of this Standard."

2.1.2 Modify the following clauses in EN 81-1 and EN 81-2 as noted:

Clause 0 Clause 0 shall be read as informative.

Clause 1.4 Delete.

Clause 2 Amend the words "Normative references" in both the heading and the text to read "References".

Clause 5.2.1.1(c) and (d) Delete.

Clause 5.2.3 Delete.

Clause 6.3.1.2 Replace the words "corrugated iron" with the words "chequer plate".

Clause 6.3.5 Delete the words "Should the well be ventilated through the machine room, this has to be taken into account."

Clause 6.3.7 Reword to read:

"6.3.7 Handling of equipment

Beams, or supports or hooks attached to them, provided for the purpose of lifting machine parts shall have a notice advising the maximum permissible load that can be carried."

Clause 6.4.1.2 Replace the words "corrugated iron" with the words "chequer plate".

Clause 7.2.3.6 Reword to read:

"7.2.3.6 To avoid dragging of children's hands, automatic power operated horizontally sliding doors made of glass of dimensions greater than stated in 7.6.2 shall comprise opaque glass up to a height of 1.10 m."

Clause 7.4.2.1 Add the words "Proposals for guide design shall be to the satisfaction of the territorial authority."

Clause 7.5.2.1.1.3 Make the following changes:

i) In the first paragraph delete the words "being struck, or".

ii) Add a new paragraph at the end saying:
"The protective device shall comply with:

Clause 23.6 of NZS 4332 except that Clauses 23.6.1 (c), 23.6.2 and 23.6.3 may be modified as follows:

- a) the kinetic energy limitation of 3.4 J may be increased to 4 J, and
- b) the requirement for an audible warning to be sounded may be ignored."

Clause 8.6.7.5 Reword to read:

"8.6.7.5 To avoid dragging of children's hands, automatic power operated horizontally sliding doors made of glass of dimensions greater than stated in 7.6.2 shall comprise opaque glass up to a height of 1.10 m."

Clause 8.7.2.1.1.3 Make the following changes:

i) Delete the words "being struck, or".

ii) Add a new paragraph at the end saying:
"The protective device shall comply with Clause 23.6 of NZS 4332 except that Clauses 23.6.1 (c), 23.6.2 and 23.6.3 may be modified as follows:

- a) the kinetic energy limitation of 3.4 J may be increased to 4 J, and
- b) the requirement for an audible warning to be sounded may be ignored."

Clause 8.17.1 Reword to read:

"8.17.1 Lift car lighting shall comply with Clauses 22.20.2.1 to 22.20.2.6 inclusive of NZS 4332."

Clause 8.17.2 Delete.

Clause 8.17.4 Reword to read:

"8.17.4 Lift cars shall be provided with emergency lighting complying with Clause 22.20.2.7 of NZS 4332.

Where batteries provide the emergency lighting source, the batteries shall be secured in such a manner that they cannot be displaced or the contents spilled by the operation of the safety gear or by earthquake."

Clause 10.1.1 Delete the Note and add the words:

"Guide rails shall be designed in accordance with Annex G.

Annex G accounts for loading actions as a result of lift operation only. Other loadings, such as earthquake, also need to be checked but are outside the scope of EN 81. Refer to Clause 1.5.1."

Clause 14.2.3.2 Delete the word "Note".

Clause 16 Amend heading to read "Lift Particulars – Tests – Maintenance".

Clause 16.1 Amend heading to read:

"16.1 Drawings and tests"

Clause 16.1.1 Amend clause to read:

"16.1.1 Drawings and particulars of the lift installation shall be supplied in accordance with Annex C. The details submitted shall show that the constituent parts are correctly designed and the proposed installation is in conformity with this Standard."

Clause 16.2 Delete.

Clause 16.3.2 Amend to read:

"16.3.2 Maintenance and inspection

Maintenance and inspection shall comply with the requirements of Clause 2.5 of NZS 4332."

Clause 16.3.3 Delete.

Annex D

Clause D.1 Amend (a) to read:

"Comparison of the as-built installation with the drawings and particulars supplied under Clause 16.1.1. Variations from the plans and specifications on which the *building consent* was granted need to be approved by the *territorial authority*."

Clause D.2 (c) Replace the words "register or file [16.2.a)]" with the words "drawings and particulars of the lift installation [(16.1.1)]".

Annex E Delete.

Annex G In the heading replace the word "informative" with the word "normative".

2.2 Amendments to EN 81-1

Modify the following clauses of EN 81-1 as noted. These amendments must be made in addition to those required in Paragraph 2.1 (i.e. Paragraphs 2.1.1 and 2.1.2) above.

Clause 5.7.3.2 Amend last sentence of last paragraph to read:

"This shall not project into the clear running space of the lift equipment and shall comply with Clause 11.5.3 of NZS 4332."

Clause 8.3.2.2 Replace the words "0.90 m and 1.10 m" with the words "0.95 m and 1.05 m".

Clause 9.3 Add the words "Demonstration of acceptable rope traction shall be to the satisfaction of the *territorial authority*."

Clause 12.4.1.3 Add new clause which reads:

"12.4.1.3 Demonstration of an acceptable braking system, which meets the requirements of 12.4, shall be to the satisfaction of the *territorial authority*."

Clause 12.8.6 Add new clause which reads:

"12.8.6 The demonstration of the acceptability of these devices to meet the requirements of 12.8 shall be to the satisfaction of the *territorial authority*."

Clause 16.1.2 Delete Note.

Clause 16.1.3 Delete.

Annex C Make the following changes:

- i) In the heading amend the words "Annex C (informative) Technical dossier" to read "Annex C (normative) Drawings and Particulars".
- ii) Amend Clause C.1 to read:
"C.1 Introduction"
The drawings and particulars shall include all of the information and documents required by this Annex."
- iii) In the second paragraph of Clause C.3 replace the words "do not have to give details of construction but they should" with the word "shall".
- iv) Amend the first paragraph of Clause C.5 to read:
"Copies of type examination certificates for:
 - a) landing door locking devices (7.7.3.3);
 - b) safety gear (9.8.1.3);
 - c) overspeed governors (9.9.12);
 - d) energy dissipation type buffers, energy accumulation type buffers with buffered return movement and/or non-linear characteristics (10.3.6);
 - e) safety circuits containing electronic components (14.1.2.3.3); and
 - f) ascending car overspeed protection means (9.10.11)."
- v) In the second paragraph of Clause C.5 replace the words "ropes, chains" with the words "ropes and chains and their terminations".

2.3 Amendments to EN 81-2

Modify the following clauses of EN 81-2 as noted. These amendments must be made in addition to those required in Paragraph 2.1 (i.e. Paragraphs 2.1.1 and 2.1.2) above.

Clause 5.7.2.2 Amend last sentence of last paragraph to read:

"This shall not project into the clear running space of the lift equipment and shall comply with Clause 11.5.3 of NZS 4332."

Clause 5.7.3 Add new Clause 5.7.3 to read:

"5.7.3 Devices to hold car above the lowest floor"

For direct-acting electrohydraulic lifts, suitable devices shall be provided to hold the car above the lowest floor. Such devices shall support the car as necessary during all testing and maintenance without impinging on the clearances required by this Standard.

If the device is not permanently fixed in place it shall remain on the site in an area exclusively for the use of the lift installation. If stored in the pit it shall not interfere with the lift installation nor with any clearance required by this Standard.

Proposals for the device, demonstrating compliance with the requirements of this Clause, shall be to the satisfaction of the *territorial authority*."

Clause 8.3.2.1 Fourth paragraph Replace the words "0.90 m and 1.10 m" with the words "0.95 m and 1.05 m".

Clause 9.1 Add the words:

"Demonstration of an acceptable means of suspension shall be to the satisfaction of the *territorial authority*."

Clause 9.10.5.1 Reword lead-in paragraph to read:

"Where tripping of the safety gear or clamping device is by rope the following shall apply:"

Clause 9.10.5.2 Reword lead-in paragraph to read:

"Where tripping of the safety gear or clamping device is by lever the following shall apply:"

Clause 12.3.3.4 Add the words:

"The acceptability of the bend to carry the required pressures shall be demonstrated to the satisfaction of the *territorial authority*."

Clause 16.1.2 Delete the second paragraph and the Note.

Annex C Make the following changes:

- i) In the heading amend the words
"Annex C (informative) Technical dossier" to read "Annex C (normative) Drawings and Particulars".
- ii) Amend Clause C.1 to read:

"C.1 Introduction

The drawings and particulars shall include all of the information and documents required by this Annex."

- iii) In the second paragraph of Clause C.3 replace the words "do not have to give details of construction but they should" with the word "shall".
- iv) Amend the first paragraph of Clause C.5 to read:
"Copies of type examination certificates for:
 - a) landing door locking devices (7.7.3.3);
 - b) safety gear (9.8.9);
 - c) overspeed governors (9.10.2.11);
 - d) energy dissipation type buffers, energy accumulation type buffers with buffered return movement and/or non-linear characteristics (10.3.8);
 - e) safety circuits containing electronic components (14.1.2.3.2.6);
 - f) rupture valve (12.5.5.7); and
 - g) one-way restrictor with mechanical moving parts (12.5.6.6)."
- v) In the second paragraph of Clause C.5 replace the words "ropes, chains" with the words "ropes and chains and their terminations".

Verification Method D2/VM2

Domestic and Service Lifts

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/s²

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_e = maximum load (N)

E = modulus of elasticity (MPa)

I = moment of inertia of ram (cm⁴)

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”.

3.0 Additional Rules

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:

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.”

Verification Method D2/VM3

Escalators and Moving Walks

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

Acceptable Solution D2/AS3

Escalators and Moving Walks

1.0 Reference Document

1.0.1 EN 115 is approved as an acceptable solution when modified as shown in Paragraphs 2.0 and 3.0.

2.0 Modified Rules

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.

3.0 Additional Rules

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.”