ORIGIN
FIRE CONSULTANTS
CREATIVE COLLABORATORS

Security vs Means of Escape

Locked out

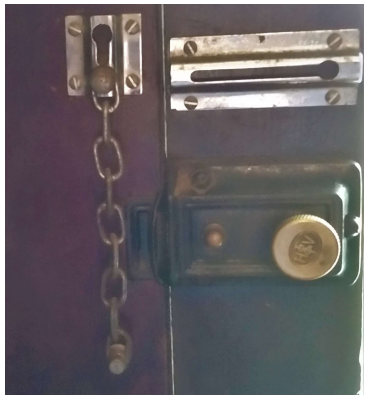
Locked in

CONTENTS

- Introduction
- Regulatory regime
- Compliance Schedule Handbook
- Acceptable Solutions
- Verification Method
- Alternative Solutions
- Case Study
- Conclusion

INTRODUCTION

Locks are really important to our lives



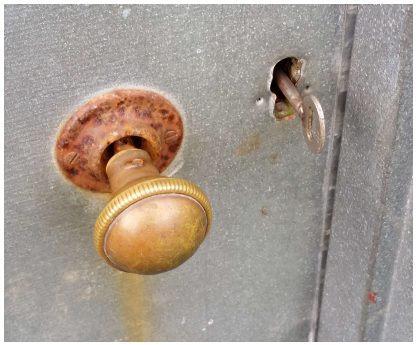
Front Door

Back Door

Handy unlocking devices

Garden shed

Garage tilt a door



Garage access door

INTRODUCTION

Locks are really important to our lives

Office Front Door

Middle Lock

Middle Lock

Bottom lock

Bottom lock

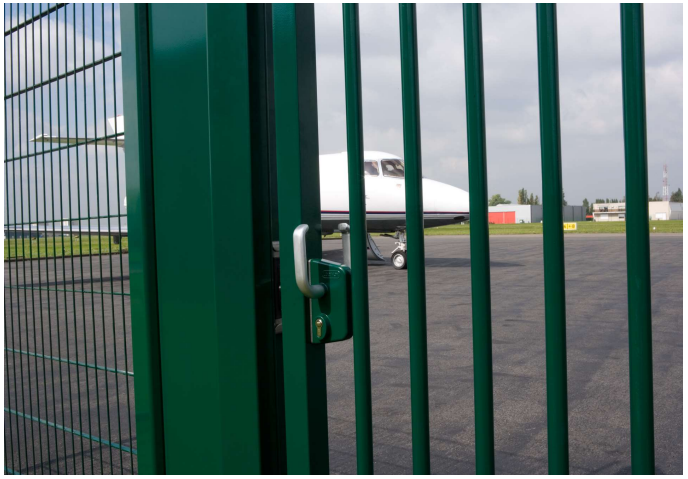
WHEN DO WE NEED LOCKS?

Stopping People getting in

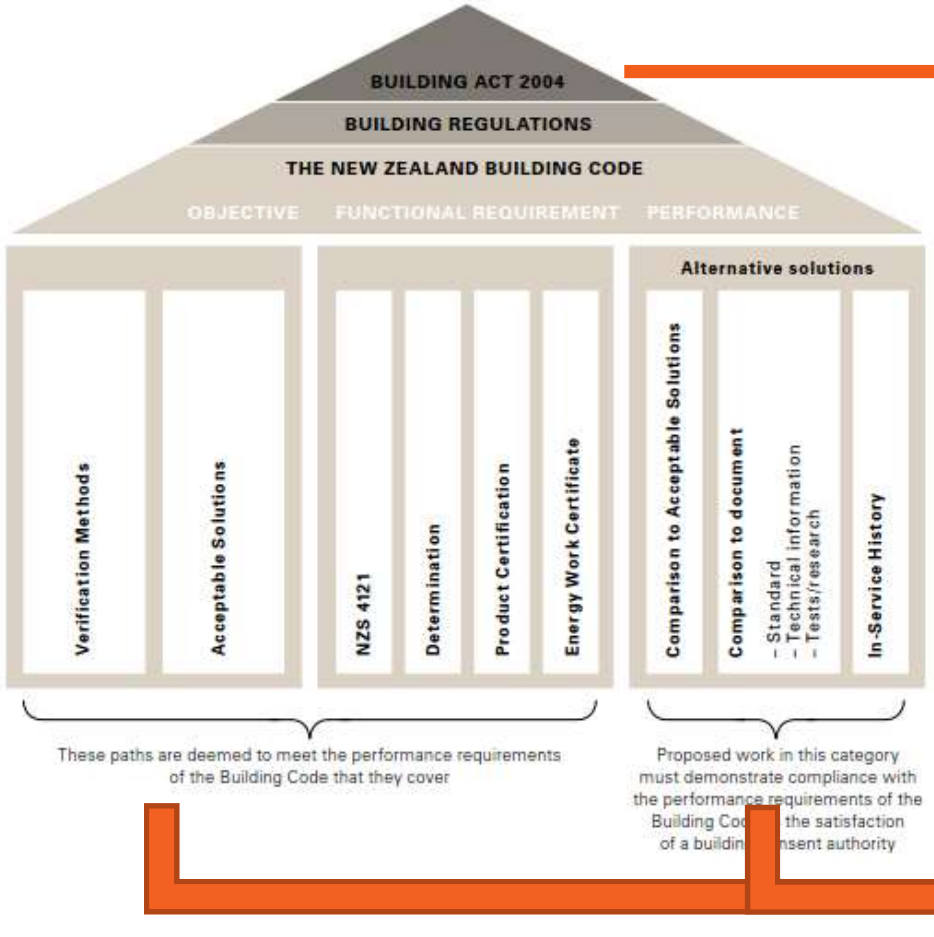
- Gates at front entrance
- Front door
- Secure rooms
- Apartment/ hotel room doors
- Entry from stair back into a floor
- Classrooms out of hours

Stopping people getting out

- Prisons
- Dementia wards
- Pre school's
- Zoo's



REGULATORY REGIME



5.6 Compliance schedules (sections 100 to 107)

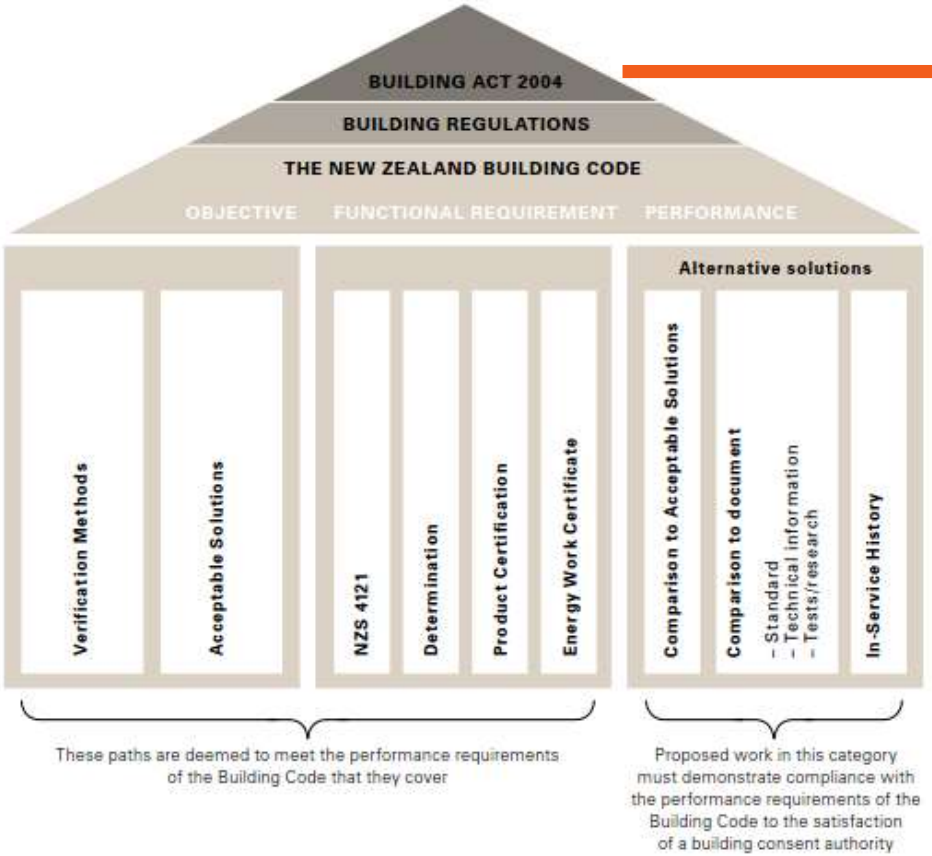
A compliance schedule lists specified systems within a building. The compliance schedule for a building must identify which specified systems are present, the performance standards for those systems, and how those systems will be inspected and maintained to ensure they continue to function.

For more information on compliance schedules, see the Compliance Schedule Handbook.

5.7 Building warrants of fitness (sections 108 to 111)

A building warrant of fitness (BWoF) is a statement supplied by a building owner, to the territorial authority confirming that the systems specified in the compliance schedule for their building have been maintained and checked in accordance with the compliance schedule for the previous 12 months, and will continue to perform as required. For more information on building warrants of fitness, see the Compliance Schedule Handbook.

REGULATORY REGIME



5.6 Compliance schedules (sections 100 to 107)

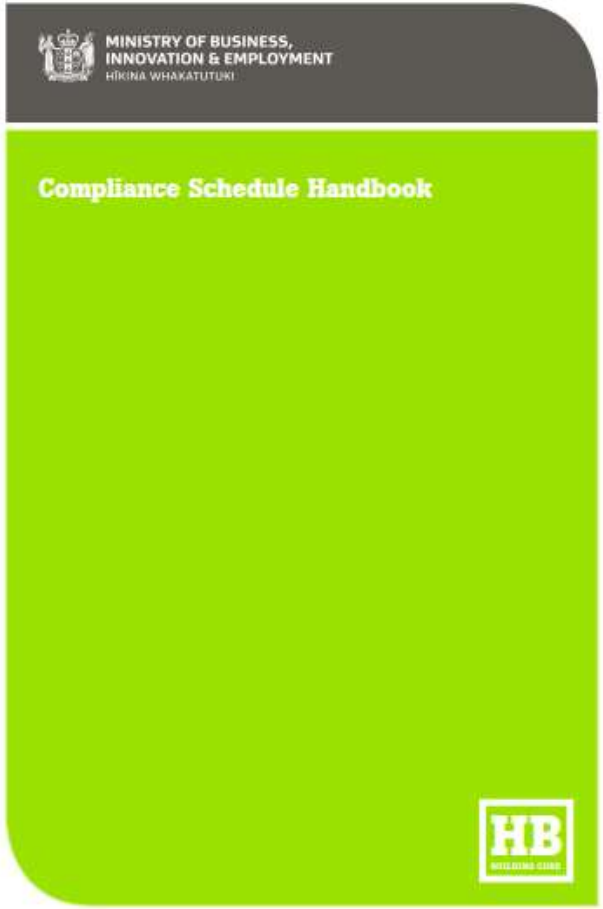
A compliance schedule lists specified systems within a building. The compliance schedule for a building must identify which specified systems are present, the performance standards for those systems, and how those systems will be inspected and maintained to ensure they continue to function.

For more information on compliance schedules, see the Compliance Schedule Handbook.

5.7 Building warrants of fitness (sections 108 to 111)

A building warrant of fitness (BWoF) is a statement supplied by a building owner, to the territorial authority confirming that the systems specified in the compliance schedule for their building have been maintained and checked in accordance with the compliance schedule for the previous 12 months, and will continue to perform as required. For more information on building warrants of fitness, see the Compliance Schedule Handbook.

Compliance Schedule handbook



Daily and monthly inspections

Doors should be inspected to ensure they can be opened and that they are not:

B.5 locked

B.6 barred

B.7 blocked.

Annual inspections

Inspection of the following should be carried out when appropriate to the installation.

B.8 Auto door controller operation

In addition to being inspected, the following should be tested for effective operation when appropriate to the installation.

B.20 Electrical and mechanical lock

B.21 Battery back-up

B.22 Brake settings

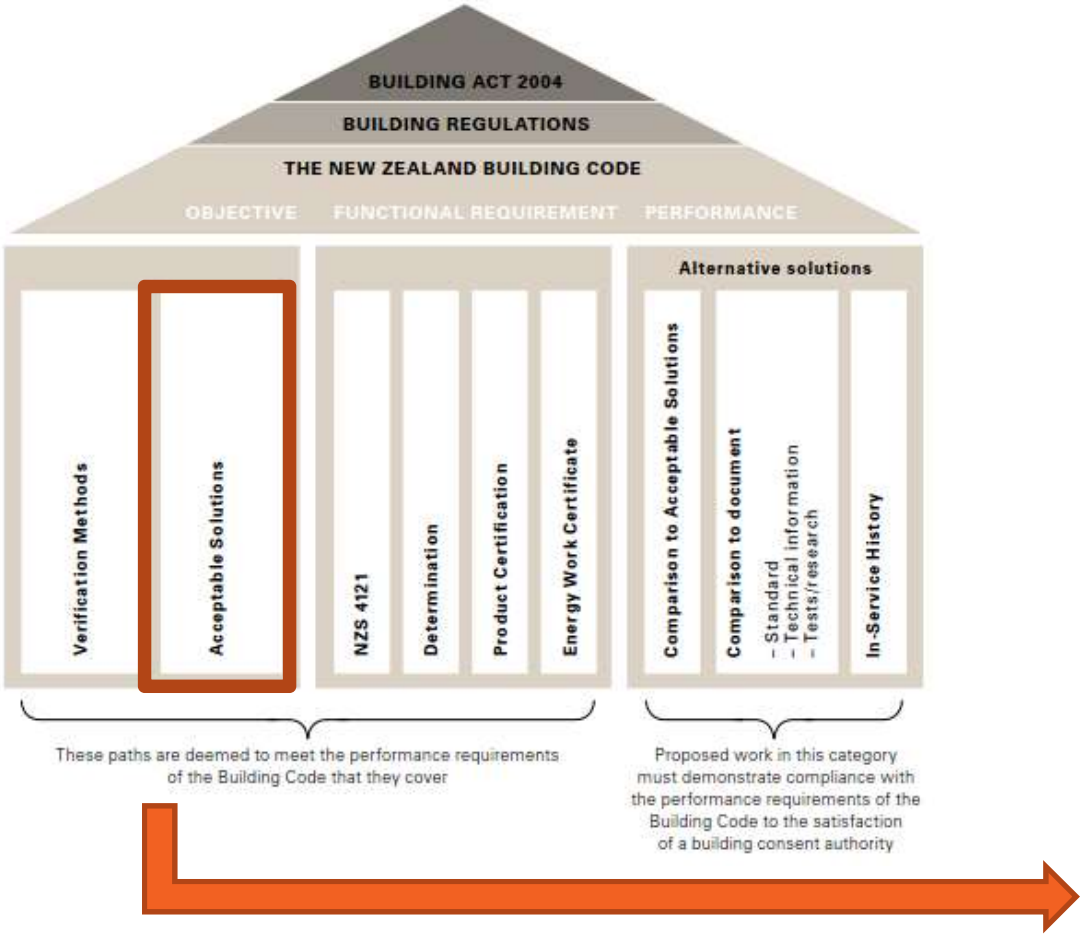
B.23 Panic breakout or fail-safe devices

B.24 Interface between the automatic doors and the building's emergency warning system

B.25 Motion pick up of sensors at shallow angles

B.26 Door timing (it should remain open for at least five seconds)

REGULATORY REGIME



5.6 Compliance schedules (sections 100 to 107)

A compliance schedule lists specified systems within a building. The compliance schedule for a building must identify which specified systems are present, the performance standards for those systems, and how those systems will be inspected and maintained to ensure they continue to function.

For more information on compliance schedules, see the Compliance Schedule Handbook.

5.7 Building warrants of fitness (sections 108 to 111)

A building warrant of fitness (BWoF) is a statement supplied by a building owner, to the territorial authority confirming that the systems specified in the compliance schedule for their building have been maintained and checked in accordance with the compliance schedule for the previous 12 months, and will continue to perform as required. For more information on building warrants of fitness, see the Compliance Schedule Handbook.

Acceptable Solutions - C/ASx

Locking devices

3.15.2 If the *building* is occupied, locking devices shall:

a) Be clearly visible, located where such a device would be normally expected and, in the event of *fire*, designed to be easily operated without a key or other security device, and allow the door to open in the normal manner.

If the operation of a locking device is unusual, such as the pressing of a button close to the door, it shall have signage that complies with NZBC F8.3.1, and

Comment:
Examples of unacceptable locking or security devices are card access and keypad locks that are not interfaced with the fire alarm and detection systems.

b) Not prevent or override the direct operation of panic fastenings fitted to any door

c) If they are of an electromechanical type, they shall, in the event of a power failure or door malfunction, either:

i) automatically switch to the unlocked (fail-safe) condition, or

ii) be readily opened by an alternative method satisfying the requirements of Paragraph 3.15.2 a), and

d) If the *escape height* is greater than 25m occupants in the vertical *safe path* shall be able to re-enter a floor at a maximum interval of 4 floors. Doors required to be unlocked from the *safe path* side may be unlocked at all times or only when the fire alarm is activated. Doors designated as available for entry shall have signage indicating their status.

Acceptable Solutions - C/ASx

Comment:
One way of ensuring compliance with Paragraph 3.15.2 is to develop a building management plan.

This Acceptable Solution specifies that the greatest distance between unlocked stair doors is 3 floors. This is to ensure that:

a) In multi stair *buildings*people escaping down a stair are able to move from one stair to another and can continue their escape along an alternative route via a route across a floor if one stair becomes smoke-logged or unusable for any other reason.

b) In single stair *buildings* people are able move out of the stair and wait for rescue by emergency services within the floor.

The requirement applies to the whole height of the vertical *safe path*, meaning that once required on a *safe path* greater than 25 m, *escape height* floors between 25 m and ground also have to comply. The doors may be locked during normal occupation but must be available upon activation of the fire alarm.

Amend 2 Dec 2013

Amend 3 Jul 2014

Amend 2 Dec 2013

Acceptable Solutions - C/ASx

Simple fastenings

3.15.14 Doors on *escape routes* (whether or not the doors are *fire doors*) shall be fitted with simple fastenings that can be easily operated from the direction from which people approach when making their escape.

Comment:
This generally excludes the use of keyed locks and bolt fastenings. See Paragraph 3.15.2 for security and safety.

Delayed action unlocking devices

3.15.11 Delayed action unlocking devices on *escape routes* shall be installed only if:

a) The *firecell* is protected by a Type 4 or Type 7 alarm system, and

b) *Fire* alarm activation instantly overrides any delay, and

c) The delay in operation does not exceed 15 seconds, and

d) Signage warning of the delay in operation and complying with NZBC F8.3.1 is provided.

Comment:
A delayed action unlocking device is a security mechanism that allows a door to be unlocked without the use of a key, but does not release the door under non-emergency conditions until after a time delay. The time delay allows the person intending to use the door to be checked for security reasons.

Acceptable Solutions - C/ASx

Door closers and latching

3.15.1 Except as permitted by Paragraph 3.15.7 (revolving doors, automatic doors and access control systems), doors on *escape routes* shall satisfy the following requirements:

a) They shall be hinged or pivoted on one vertical edge only, except that sliding doors may be used where the space, including an *exitway*, has an *occupant load* of less than 20. Roller shutter doors or tilt doors shall not be used as *escape route* width except in an intermittently *occupied space* where the roller shutter door is the only *access route* and is open at all times the space is occupied, and

b) *Fire* and *smoke control doors* shall be self-closing, and the self-closing device shall either be:

i) active at all times, or

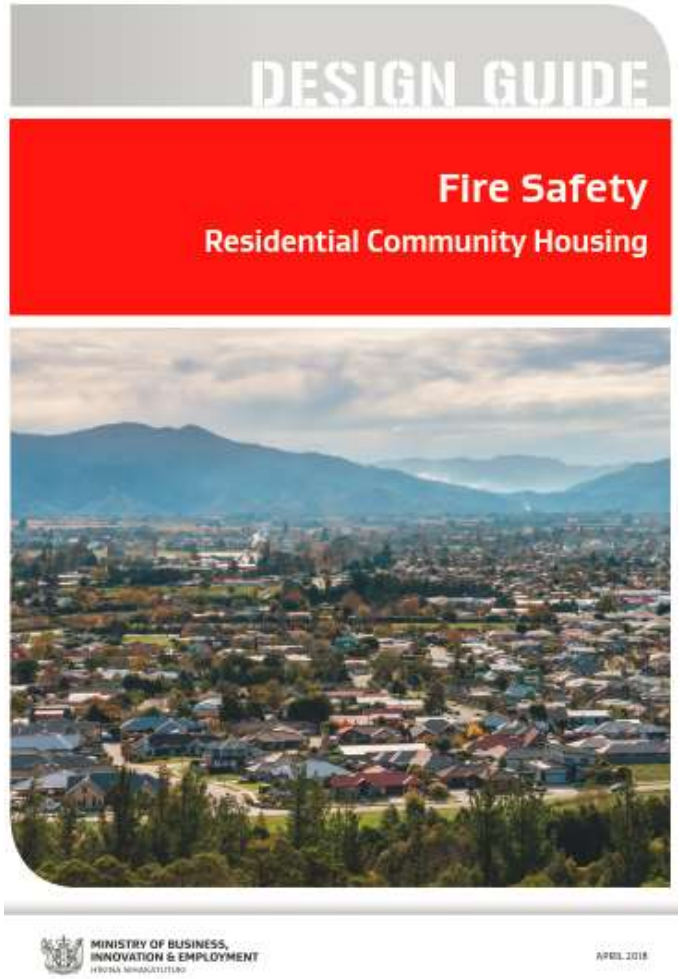
ii) activated by releasing a *hold-open device* in response to operation of a smoke detector (see Paragraph 3.15.10), or

iii) a self-closer that is activated by operation of a smoke detector but allows the door to swing freely at other times. The smoke detector requirements shall be the same as for a *hold-open device* (see Paragraph 3.15.10), and

c) If such doors are required to be secure, they shall be fitted with simple fastenings that can be readily operated from the direction approached by people making an escape complying with Paragraph 3.15.14, and

d) They shall not be fitted with any locking devices unless these comply with Paragraph 3.15.2, and

Residential and community housing



3.2.2 Locking devices

If the *building* is occupied, locking devices shall:

(a) be clearly visible, located where such a device would normally be expected and, in the event of fire, either be:

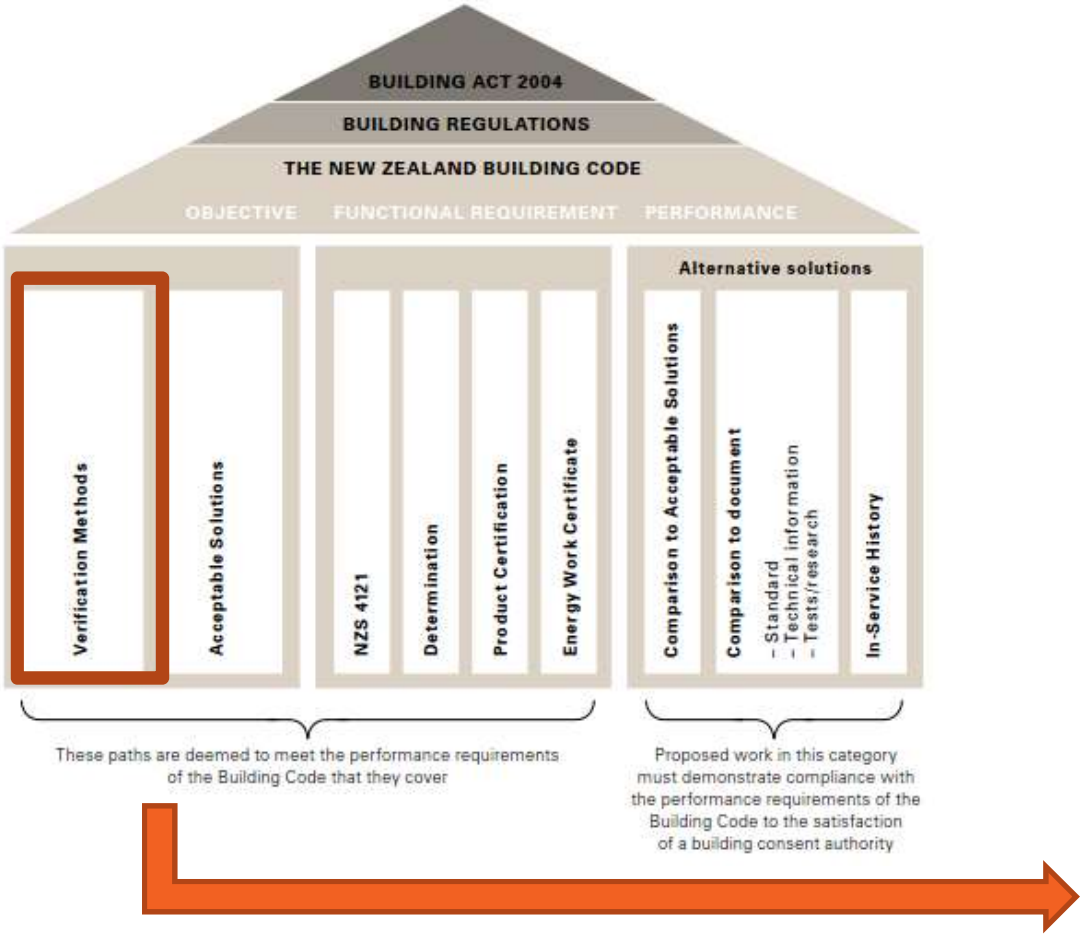
i) designed to be easily operated without a key or other security device, and allow the door to open in the normal manner; or

ii) readily opened by an alternative method satisfying the intent of Paragraph 3.2.3; and

3.2.3 *Controlled egress*

Where the *service provider* identifies the need for *controlled egress* this design guide requires the *housing* type (and associated *building* features and *fire safety systems*, as specified in Table 2.2) to be either C or D. In addition to these limitations the number of *controlled egress doors* within any one *building* (excluding external doors; see Paragraph 3.2.1) shall not be more than one third of the number of highest category *residents*). If this ratio is exceeded Acceptable Solution C/AS3 or another *Alternative Solution* applies.

REGULATORY REGIME



5.6 Compliance schedules (sections 100 to 107)

A compliance schedule lists specified systems within a building. The compliance schedule for a building must identify which specified systems are present, the performance standards for those systems, and how those systems will be inspected and maintained to ensure they continue to function.

For more information on compliance schedules, see the Compliance Schedule Handbook.

5.7 Building warrants of fitness (sections 108 to 111)

A building warrant of fitness (BWoF) is a statement supplied by a building owner, to the territorial authority confirming that the systems specified in the compliance schedule for their building have been maintained and checked in accordance with the compliance schedule for the previous 12 months, and will continue to perform as required. For more information on building warrants of fitness, see the Compliance Schedule Handbook.

VERIFICATION METHOD C/VM2

1.2 Scope

1.2.1 This Verification Method is for *fire* designs for all *buildings* except those *buildings* that:

a) Do not have simultaneous evacuation schemes that evacuate immediately to the outside, or

b) Require a managed evacuation, or

c) Contain *fire hazards* that are not defined by Part 2 of this Verification Method "The rules and parameters for the Design Scenarios".

Comment:

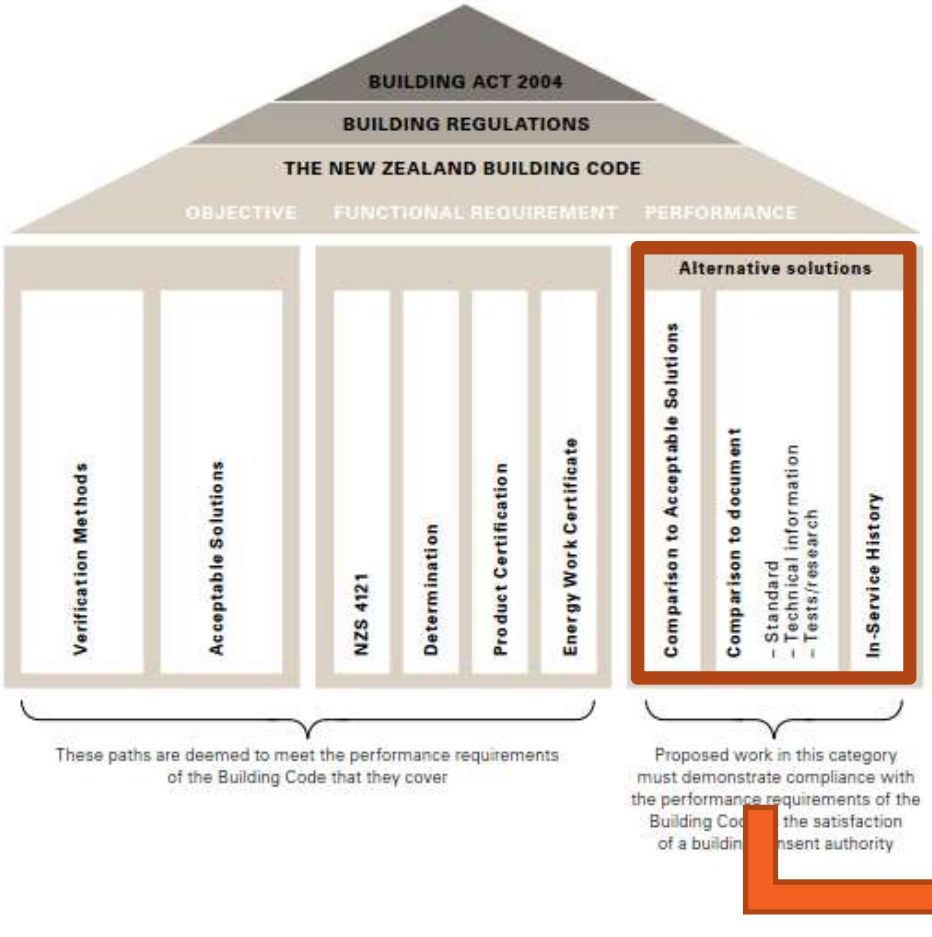
1. This Verification Method is an analysis tool for *buildings* with simultaneous evacuation schemes that evacuate immediately to the outside, and with typical *fire growth* rates.
2. Additional *fire* safety precautions to those determined by this Verification Method may be necessary to facilitate approval of the intended evacuation procedures to meet the Fire Safety and Evacuation of Buildings Regulations 2006.
3. Examples of *buildings* outside of the scope include hospitals, care homes, stadia, principal transport terminals, large shopping malls (greater than 10,000 m^2 and contain mezzanine floors), tall *buildings* (greater than 60 metres or 20 storeys in height) or tunnels.
4. *Fire* safety design for *buildings* that are outside of the scope can be performed using the Fire Engineering Brief (FEB) process and the appropriate parts of this Verification Method, which can be considered by the *building consent authority* as an *alternative solution*.

VERIFICATION METHOD C/VM2

The following general requirements apply to escape routes which assist in the movement
of people.

• All locking devices on doors on escape routes shall be clearly visible, located where such a device would normally be expected, **easily operated without a key or other security device**, and allow the door to open in the normal manner and **'fail safe'** (operability, location/height).
• Any doors that are electronically locked are required to be provided with a **fail safe emergency door release** which allows unobstructed escape.
• Stairwell doors are not to be locked from within the stairwell, so that occupants are able to re-enter other levels of the building from the stair.
• Switches/buttons required as part of the fire safety design (eg, **emergency door lock releases**) shall be at a height and in a location readily accessible by all occupants including those with disabilities (refer to Acceptable Solution D1/AS1).

REGULATORY REGIME



5.6 Compliance schedules (sections 100 to 107)

A compliance schedule lists specified systems within a building. The compliance schedule for a building must identify which specified systems are present, the performance standards for those systems, and how those systems will be inspected and maintained to ensure they continue to function.

For more information on compliance schedules, see the Compliance Schedule Handbook.

5.7 Building warrants of fitness (sections 108 to 111)

A building warrant of fitness (BWoF) is a statement supplied by a building owner, to the territorial authority confirming that the systems specified in the compliance schedule for their building have been maintained and checked in accordance with the compliance schedule for the previous 12 months, and will continue to perform as required. For more information on building warrants of fitness, see the Compliance Schedule Handbook.

FIRE ENGINEERING GOALS

Building Act 2004

Ensure **people** can escape a building in case of fire.

Building Code clause C1 objectives

(a) safeguard **people** from an unacceptable risk of injury or illness caused by fire,

(b) protect **other property** from damage caused by fire, and

(c) facilitate **firefighting** and rescue operations.

FIRE ENGINEERING GOALS

Building Code Clause C4

[C4—MOVEMENT TO PLACE OF SAFETY

Provisions

FUNCTIONAL REQUIREMENT

C4.1 *Buildings* must be provided with:

(a) effective means of giving warning of *fire*, and

(b) visibility in *escape routes* complying with clause F6.

C4.2 *Buildings* must be provided with means of escape to ensure that there is a low probability of occupants of those buildings being unreasonably delayed or impeded from moving to a *place of safety* and that those occupants will not suffer injury or illness as a result.

Building Code clause C4

PERFORMANCE

C4.3 The *evacuation time* must allow occupants of a building to move to a *place of safety* in the event of a fire so that occupants are not exposed to any of the following:

(a) a *fractional effective dose* of carbon monoxide greater than 0.3:

(b) a *fractional effective dose* of thermal effects greater than 0.3:

(c) conditions where, due to smoke obscuration, visibility is less than 10 m except in rooms of less than 100 m^2 where visibility may fall to 5 m.

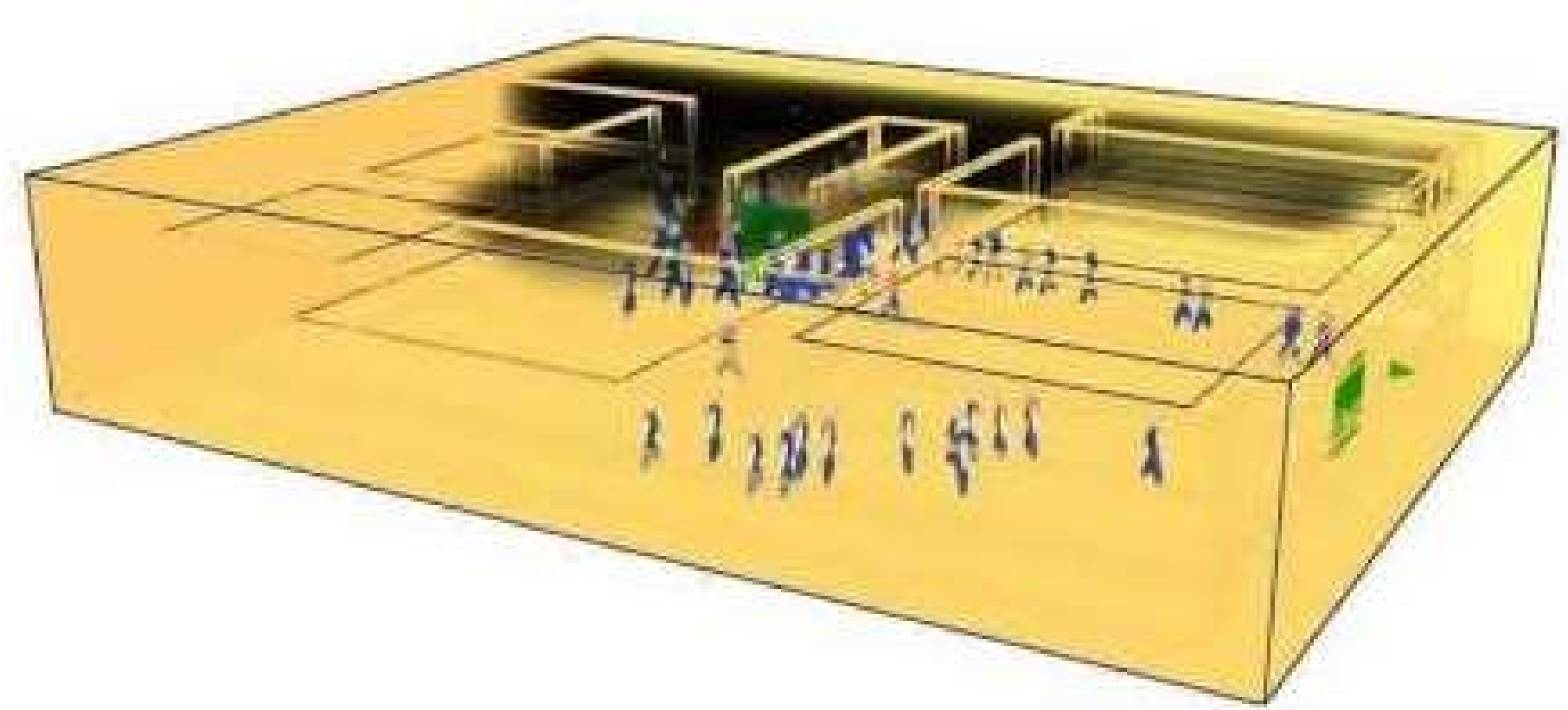
C4.4 Clause C4.3(b) and (c) do not apply where it is not possible to expose more than 1 000 occupants in a *firecell* protected with an automatic *fire* sprinkler system.

C4.5 Means of escape to a *place of safety* in *buildings* must be designed and constructed with regard to the likelihood and consequence of failure of any *fire safety systems*.

THE BUILDING CODE IS LOCK NEUTRAL

As long as people can escape safely from a fire

CAN PEOPLE ESCAPE SAFELY FROM A FIRE?



Smoke and egress modelling

RULE OF THUMB

Use common sense

If it is difficult or complicated to use and delays the evacuation time then it is probably not ok.

CASE STUDY- DETERMINATION 2018/028

The building

A block of retail outlets with a set of shared toilets with the only egress route from the toilets out through one of the shops.

The problem

How to balance the requirement for egress with the need for security for each shop?

CASE STUDY- DETERMINATION 2018/028

What do the Acceptable Solutions say?

- Allows for out of hours locking.
- Allows locks that can be opened without a key in the direction of escape.
- Does not allow lock that they occupants require a key to escape.

The Acceptable Solutions do not easily demonstrate compliance

CASE STUDY- DETERMINATION 2018/028

What does the Building Code say?

- C4.2 Buildings must be provided with means of escape to ensure that there is a low probability of occupants of those buildings being unreasonably delayed or impeded from moving to a place of safety and that those occupants will not suffer injury or illness as a result.

The Building Code does not specifically prohibit locks

CASE STUDY- DETERMINATION 2018/028

Who are the occupants?

- The occupants are the people that are lawfully entitled to be in the building and would be expected to be there as per the use of the building. In this case it could be the shop keepers, shoppers and cleaners. It does not include burglars or people unlawfully in the building.

CASE STUDY- DETERMINATION 2018/028

What sort of locks would be ok?

- Key to get in to the toilets and automatically close and lock behind. Key to get out.
- Lock can be opened with a handle on the tenancy side and automatically closes and locks behind. Needs a key to get out.
- Key to unlock. Key to lock. No automatic locking.

Which lock do you chose?

CASE STUDY- DETERMINATION 2018/028

Key to unlock and key to lock. No automatic locking

- If you unlock, go in and lose your key you can get out.
- If someone unlocks for you, they are unlikely to lock till you come out.
- It can be locked at night once everyone has left.

CONCLUSION

Locks can be used in buildings provided

- There is a low probability of the occupants being unreasonably delayed or impeded from moving to a place of safety and that those occupants will not suffer injury or illness as a result.

This can be demonstrated by

- Calculations in the case of delayed unlocking
- By thinking through how the people using the lock will behave

Locks can be used for

- Locking the building after all occupants have left the building.

ORIGIN
FIRE CONSULTANTS
CREATIVE COLLABORATORS

THANK YOU!

See you soon :)