

Means of escape from fire passive features and reasonable grounds. Code compliance issues;

A Discussion Paper; this is a work in progress and subject to updates

(comments, critique and feedback is appreciated)

1. Introduction;

Recently there has been a trend to increase the claim for weathertight and other building defect issues to include the work that might be required as a consequence of the building consent for the repairs that under s112 must include an upgrade for means of escape from fire. This has coincided with changes to the fire safety clauses and directions as to what is required to assess a building if it has a specified system that requires a compliance schedule.

The intention of s112 had been to accept non compliance of older buildings because of the economic cost to upgrade for the code clauses but making an exception for Means of escape from fire clauses and also disabled access if applicable. This recognised that many old buildings could have poor fire safety features and when a building was being worked on this was a good opportunity to at least ensure that basic escape routes and warning systems were in place. It was accepted that other fire clauses such as protection of other property and vertical and horizontal fire spread were not generally part of these requirements. S112 only nominated the Means of Escape clauses and this reference rather than to the Fire Safety clauses in general indicates that parliament intended this to be a narrow focus. (Means of Escape is a defined term in the act and this is discussed later.)

During reclad work in recent times it is not uncommon to find defects in the fire and sound separations in multi-dwelling buildings. These can range from non existent separations to holes to damage to fire rated walls from subsequent work or penetrations not sealed correctly when built

Claims have generally two strands;

1. Allegation of breaches of the code in particular the C fire safety clause'

This has two parts;

- a. Allegations that the building work was not compliant to CAS1 as constructed in say 2005.
- b. the work was not code compliant when built and is not today.

2. Considerable work that is then being claimed to be done to satisfy the s112 Means of Escape from Fire upgrade requirements triggered by a building consent application.

These are similar arguments as have been run in leaky claims and allowed over the years . It must be remembered that NZ's 10 year long stop period for claiming for building defects encourages a catch

all mentality when a claim is made as this may be the only chance for a building owner to get a claim settled through the courts.

During the leaky decade just past there was little discussion of code compliance except for an underlying belief that E2 required buildings to not leak and B2 Durability required them to be durable so leaky homes was perceived as a failure of both.

There was little attempt to defend the construction particularly from council who were more focused on implicating other parties than defending their position.

There was no discussion on whether E2 allowed for a leak that could be repaired or what constituted Normal Maintenance under B2. Regular maintenance is now recognised in E2As1 the acceptable solution which means the deemed to comply solution has an allowance for failure and premature failure but this has yet to be argued in court as a defence.

The possibility of failure of a compliant solution and who is responsible for ongoing compliance should have been argued at the first proceedings but it was not done (or done successfully) and precedents were then set and built on. (Colleen Dicks case etc)

3. The basis of a claim.

Council usually have a particular claim against them based on the duty of care they owe to home owners. This same duty of care is not applied to commercial owners as they have ways to manage economic loss and risk. Council's statement of consent and compliance are based on whether there was reasonable grounds to issue the CCC or consent.

Due to long stop period claims are now coming forward for BA 2004 consents. If the consent was issued under the Building Act 2004 then the CCC issued that the building work on reasonable grounds complied with the building consent. The building consent was issued on the building work complying with the building code

The reasonable grounds argument is an important aspect to this.

Fire stops to gaps and penetration are general requirements commonly inspected and understood to maintain smoke and fire separations.

Failure to provide these is a failure of the acceptable solution but it may not be a failure of the code clause if the design and construction mitigates the defect. Providing stops ensures compliance but their omission is not automatically a breach of the code clause. (ie deemed to comply with prescribed details does not mean non compliance with the code clause but can only mean only the acceptable solution).

Acceptable solutions are worst case solutions and an as built assessment is required to establish a breach of the code clause which must also be a likelihood of a failure of the performance criteria and the functional requirement.

Other parties may also owe a duty of care but may have a contractual relationship as well.

4. The current Building consent application;

Prior to proceedings a consent is applied for. The emphasis seems to be on upgrading the building to the present requirements. This is perceived as compliance with the current acceptable solution or as nearly as reasonably practical (ANARP) which should be a commonsense approach to what is there and what is missing and an appreciation of what could be done but is instead perceived as a mandatory requirement to close the gap.

S112 only requires upgrade with means of escape from fire. But the questions are raised as to what this covers when other issues are suspected or apparent and the level of certainty required.

5. The consent issues

The 'building work' is defined in the act as the work for in connection with the construction alteration demolition or removal of a building" or the work to the building not the building itself unless the building work is a new building.

A determination 2010-80 stated that;

- 6.4 I note that it is my view that once a code compliance certificate has been issued for building work, an authority is unable to take any action in respect of that work unless:
- the building is dangerous, is earthquake-prone, or is insanitary, or
 - the owner decides to alter the building, change its use, or change its intended life.
- 6.5 While the condition of the building may mean that it is not currently code-compliant, this of itself does not oblige a building owner to bring the existing building into compliance with the Building Code. A building owner is only obliged to undertake building work in respect of an existing building for the reasons given in paragraph 6.4.

Dangerous is defined in the act as ;

121 Meaning of dangerous building

- (1) A building is **dangerous** for the purposes of this Act if,—
- (a) in the ordinary course of events (excluding the occurrence of an earthquake), the building is likely to cause—
- (i) injury or death (whether by collapse or otherwise) to any persons in it or to persons on other property; or
- (ii) damage to other property; or
- (b) in the event of fire, injury or death to any persons in the building or to persons on other property is likely.
- (2) For the purpose of determining whether a building is dangerous in terms of subsection (1)(b), a territorial authority—
- (a) may seek advice from members of the New Zealand Fire Service who have been notified to the territorial authority by the Fire Service National Commander as being competent to give advice; and
- (b) if the advice is sought, must have due regard to the advice.

So council cannot act unless the building is dangerous or insanitary and they cannot act because they think the building is non compliant and the owner chooses the extent of the building work if done to a building but cannot be made to upgrade for any code clause except for Means of escape from fire and disabled access under s112.

Strictly councils are not the arbiters of code compliance; Under s19 this is the domain of the compliance documents, product certification and the determination process under s178. It is a moot point but a failure to be satisfied is really just that and councils do not determine non compliance which requires evidence of a breach. Compliance is not determined by council but they do need to be satisfied on reasonable grounds to issue the building consent and the CCC that follows the completion of the work. If there is a doubt as to compliance the appropriate resort is to the determination process under s178.

Council policy is often risk averse and driven by council self interest rather than the strict letter of the law. To be fair the courts have been somewhat unfair in attributing liability to council which while generally at a lower level say 20% under joint and several in NZ law the ratepayer often ends up picking up all the costs.

6. The code clauses;

S17 of the building code says that the building work has to comply with the building code. The building work is the work to the building and this has to comply not the building.

There has to also be a distinction between the objective of the building act that the building shall comply with the building code on reasonable grounds and the requirement for building work to comply.

Code clauses are made up of 3 parts the objective (the aim) the functional requirement (the thing the building must do to satisfy the objective and performance criteria (the qualitative and quantitative criteria that must be met to satisfy the functional requirement

The C clauses are contained in the building code and are under s17 required to be complied with when building work is undertaken. (this applies to both consented and un-consented work.)

Under s22 Compliance documents are solutions deemed to comply with the coded clause and under s25 they may be acceptable solutions or verifications methods but cannot contain contractual or commercial requirements or (b) relate to regulatory approvals or waivers or (c) be inconsistent with this act or regulations and s405 to 413 (may reference standards and codes of practice)

Verification methods are methods that verify compliance such as tests and standards This is not applicable to fire as only C/VM1 applies to solid fuel appliances.

To satisfy a code clause the designer may nominate an acceptable solution to demonstrate compliance. These are prescriptive solutions that are deemed to comply under s19 . There are 6 ways to comply an acceptable solution is a way to comply but as stated in s23 doing so is not the only way to comply. In other words an acceptable solution is deemed to comply but non compliance with one is not necessarily non compliance with a code clause.

7. The C clauses fire safety clauses and the relevant acceptable solutions;

Then;

The code clause fire safety clauses current at time of construction in 2005 were C1-C4.

This is one of the few clauses to be significantly changed since 1992

Clause C1—OUTBREAK OF FIRE

Provisions

OBJECTIVE

C1.1 The objective of this provision is to safeguard people from injury or illness caused by *fire*.

FUNCTIONAL REQUIREMENT

C1.2 In *buildings* fixed appliances using the controlled combustion of solid, liquid or gaseous fuel, shall be installed in a way which reduces the likelihood of *fire*.

PERFORMANCE

C1.3.1 Fixed appliances and services shall be installed so as to avoid the accumulation of gases within the installation and in *building* spaces, where heat or ignition could cause uncontrolled combustion or explosion.

C1.3.2 Fixed appliances shall be installed in a manner that does not raise the temperature of any *building element* by heat transfer or concentration to a level that would adversely affect its physical or mechanical properties or function.

Limits on application

Clause C2–MEANS OF ESCAPE

Provisions

OBJECTIVE

C2.1 The objective of this provision is to:

- (a) Safeguard people from injury or illness from a *fire* while escaping to a *safe place*, and
- (b) Facilitate *fire* rescue operations.

FUNCTIONAL REQUIREMENT

C2.2 *Buildings* shall be provided with *means of escape from fire* which:

- (a) Give people *adequate* time to reach a *safe place* without being overcome by the effects of *fire*, and
- (b) Give fire service personnel *adequate* time to undertake rescue operations.

PERFORMANCE

C2.3.1 The number of *open paths* available to each person escaping to an *exitway* or *final exit* shall be appropriate to:

- (a) The *travel distance*.
- (b) The number of occupants,
- (c) The *fire hazard*, and
- (d) The *fire safety systems* installed in the *firecell*.

C2.3.2 The number of *exitways* or *final exits* available to each person shall be appropriate to:

- (a) The *open path travel distance*,
- (b) The *building height*,
- (c) The number of occupants,
- (d) The *fire hazard*, and
- (e) The *fire safety systems* installed in the *building*.

C2.3.3 *Escape routes* shall be:

- (a) Of *adequate* size for the number of occupants,

Provisions

- (b) Free of obstruction in the direction of escape,

- (c) Of length appropriate to the mobility of the people using them,

- (d) Resistant to the spread of *fire* as required by Clause C3 “Spread of Fire”,

- (e) Easy to find as required by Clause F8 “Signs”,

- (f) Provided with *adequate* illumination as required by Clause F6 “Lighting for Emergency”, and

- (g) Easy and safe to use as required by Clause D1.3.3 “Access Routes”.

Limits on application

Performance C2.3.3(b) must not prevent a door that forms part of an *escape route* from being locked if the person who locks it is satisfied that no-one is in that part of the *building* served by the *escape route* and that no one is likely to enter that part of the *building*, except in an emergency, without unlocking that door.

Clause C3–SPREAD OF FIRE

Provisions	Limits on application
OBJECTIVE C3.1 The objective of this provision is to: <ul style="list-style-type: none"> (a) Safeguard people from injury or illness when evacuating a <i>building</i> during <i>fire</i>. (b) Provide protection to fire service personnel during firefighting operations. (c) Protect adjacent <i>household units</i>, other residential units, and <i>other property</i> from the effects of <i>fire</i>. (d) Safeguard the environment from adverse effects of <i>fire</i>. FUNCTIONAL REQUIREMENT C3.2 <i>Buildings</i> shall be provided with safeguards against <i>fire</i> spread so that: <ul style="list-style-type: none"> (a) Occupants have time to escape to a <i>safe place</i> without being overcome by the effects of <i>fire</i>, (b) Firefighters may undertake rescue operations and protect property, (c) Adjacent <i>household units</i>, other residential units, and <i>other property</i> are protected from damage, and (d) Significant quantities of <i>hazardous substances</i> are not released into the environment during <i>fire</i>. PERFORMANCE C3.3.1 Interior surface finishes on walls, floors, ceilings and suspended <i>building elements</i> , shall resist the spread of <i>fire</i> and limit the generation of toxic gases, smoke and heat, to a degree appropriate to: <ul style="list-style-type: none"> (a) The <i>travel distance</i>, (b) The number of occupants, 	

Provisions	Limits on application
<ul style="list-style-type: none"> (c) The <i>fire hazard</i>, and (d) The active <i>fire safety systems</i> installed in the <i>building</i>. C3.3.2 <i>Fire separations</i> shall be provided within <i>buildings</i> to avoid the spread of <i>fire</i> and smoke to: <ul style="list-style-type: none"> (a) Other <i>firecells</i>, (b) Spaces intended for sleeping, and (c) <i>Household units</i> within the same <i>building</i> or <i>adjacent buildings</i>. (d) <i>Other property</i>. C3.3.3 <i>Fire separations</i> shall: <ul style="list-style-type: none"> (a) Where openings occur, be provided with <i>fire resisting closures</i> to maintain the <i>integrity</i> of the <i>fire separations</i> for an <i>adequate</i> time, and (b) Where penetrations occur, maintain the <i>fire resistance rating</i> of the <i>fire separation</i>. C3.3.4 <i>Concealed spaces</i> and cavities within <i>buildings</i> shall be sealed and subdivided where necessary to inhibit the unseen spread of <i>fire</i> and smoke. C3.3.5 <i>External walls</i> and roofs shall have resistance to the spread of <i>fire</i> , appropriate to the <i>fire load</i> within the <i>building</i> and to the proximity of other <i>household units</i> , other residential units and <i>other property</i> . C3.3.6 Automatic <i>fire</i> suppression systems shall be installed where people would otherwise be: <ul style="list-style-type: none"> (a) Unlikely to reach a <i>safe place</i> in <i>adequate</i> time because of the number of storeys in the <i>building</i>, (b) Required to remain within the <i>building</i> without proceeding directly to a <i>final exit</i>, or where the <i>evacuation time</i> is excessive, 	<p>Performance C3.3.2(b) does not apply to <i>Detached Dwellings</i> or within <i>household units</i> of <i>Multi-unit Dwellings</i>.</p> <p>Performance C3.3.4 shall not apply to <i>Detached Dwellings</i>.</p>

Requirement C3.2(d) a to *buildings* where significant quantities of *hazardous* are stored and processed

Provisions	Limits on application
<ul style="list-style-type: none"> (c) Unlikely to reach a <i>safe place</i> due to confinement under institutional care because of mental or physical disability, illness or legal detention, and the <i>evacuation time</i> is excessive, or (d) At high risk due to the <i>fire load</i> and <i>fire hazard</i> within the <i>building</i>. C3.3.7 Air conditioning and mechanical ventilation systems shall be constructed to avoid circulation of smoke and <i>fire</i> between <i>firecells</i> . C3.3.8 Where an automatic smoke control system is installed, it shall be constructed to: <ul style="list-style-type: none"> (a) Avoid the spread of <i>fire</i> and smoke between <i>firecells</i>, and (b) Protect <i>escape routes</i> from smoke until the occupants have reached a <i>safe place</i>. C3.3.9 The <i>fire safety systems</i> installed shall facilitate the specific needs of fire service personnel to: <ul style="list-style-type: none"> (a) Carry out rescue operations, and (b) Control the spread of <i>fire</i>. C3.3.10 Environmental protection systems shall ensure a low probability of <i>hazardous substances</i> being released to: <ul style="list-style-type: none"> (a) Soils, vegetation or natural waters, (b) The atmosphere, and (c) <i>Sewers</i> or public <i>drains</i>. 	<p>Performance C3.3.10 applies only to <i>buildings</i> where significant quantities of <i>hazardous substances</i> are stored or processed.</p>

Clause C4—STRUCTURAL STABILITY DURING FIRE

Provisions	Limits on application
OBJECTIVE	
C4.1 The objective of this provision is to:	
<ul style="list-style-type: none"> (a) Safeguard people from injury due to loss of structural stability during fire, and (b) Protect <i>household units and other property</i> from damage due to structural instability caused by fire. 	
FUNCTIONAL REQUIREMENT	
C4.2 <i>Buildings</i> shall be constructed to maintain structural stability during fire to:	
<ul style="list-style-type: none"> (a) Allow people <i>adequate</i> time to evacuate safely, (b) Allow fire service personnel <i>adequate</i> time to undertake rescue and firefighting operations, and (c) Avoid collapse and consequential damage to adjacent <i>household units or other property</i>. 	
PERFORMANCE	
C4.3.1 Structural elements of <i>buildings</i> shall have <i>fire</i> resistance appropriate to the function of the elements, the <i>fire load</i> , the <i>fire intensity</i> , the <i>fire hazard</i> , the height of the <i>buildings</i> and the <i>fire</i> control facilities external to and within them.	
C4.3.2 Structural elements shall have a <i>fire</i> resistance of no less than that of any element to which they provide support within the same <i>firecell</i> .	
C4.3.3 Collapse of elements having lesser <i>fire</i> resistance shall not cause the consequential collapse of elements required to have a higher <i>fire</i> resistance.	

8. The new fire clauses;

What they mean? The clauses were changed in 2013; C1 now contains the objectives for all the C clauses. The functional requirements were rearranged. The new clauses are more quantitative and set verifiable numbers, whereas the old clauses were more qualitative and requirements were appropriate, adequate and likely

There is no clause called "Means of Escape from Fire" (as there was with the C2 clause circa 2005)

There is Movement to a place of safety which could be understood to mean the same. If so, the application should be similar.

C1—OBJECTIVES OF CLAUSES C2 TO C6 (PROTECTION FROM FIRE)

Provisions

The objectives of clauses C2 to C6 are to:

- (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.

Limit on application

C2—PREVENTION OF FIRE OCCURRING

Provisions

FUNCTIONAL REQUIREMENT

C2.1 Fixed appliances using controlled combustion and other fixed equipment must be designed, constructed, and installed in *buildings* in a way that reduces the likelihood of illness or injury due to *fire* occurring.

PERFORMANCE

C2.2 The maximum surface temperature of *combustible building materials* close to fixed appliances using controlled combustion and other fixed equipment when operating at their design level must not exceed 90°C.

C2.3 Fixed appliances using controlled combustion and other fixed equipment must be designed, constructed and installed so that there is a low probability of explosive or hazardous conditions occurring within any spaces in or around the *building* that contains the appliances.

Limit on application

C3—FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE**Provisions****FUNCTIONAL REQUIREMENT**

C3.1 *Buildings* must be designed and constructed so that there is a low probability of injury or illness to persons not in close proximity to a *fire source*.

C3.2 *Buildings* with a *building height* greater than 10 m where upper floors contain sleeping uses or *other property* must be designed and constructed so that there is a low probability of external vertical fire spread to upper floors in the *building*.

C3.3 *Buildings* must be designed and constructed so that there is a low probability of fire spread to *other property* vertically or horizontally across a *relevant boundary*.

Limit on application

Clause C3.2 does not apply to importance level 1 *buildings*.

C3—FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE (continued)**Provisions****PERFORMANCE**

C3.4 (a) materials used as internal surface linings in the following areas of *buildings* must meet the performance criteria specified below:

Limit on application

Clause C3.4 does not apply to *detached dwellings*, within *household units* in *multi-unit dwellings*, or *outbuildings* and *ancillary buildings*.

Area of building	Performance determined under conditions described in ISO 9705: 1993	
	Buildings not protected with an automatic fire sprinkler system	Buildings protected with an automatic fire sprinkler system
Wall/ceiling materials in sleeping areas where care or detention is provided	Material Group Number 1-S	Material Group Number 1 or 2
Wall/ceiling materials in exitways	Material Group Number 1-S	Material Group Number 1 or 2
Wall/ceiling materials in all occupied spaces in importance level 4 buildings	Material Group Number 1-S	Material Group Number 1 or 2
Internal surfaces of ducts for HVAC systems	Material Group Number 1-S	Material Group Number 1 or 2
Ceiling materials in crowd and sleeping uses except household units and where care or detention is provided	Material Group Number 1-S or 2-S	Material Group Number 1 or 2
Wall materials in crowd and sleeping uses except household units and where care or detention is provided	Material Group Number 1-S or 2-S	Material Group Number 1, 2, or 3
Wall/ceiling materials in occupied spaces in all other locations in buildings, including household units	Material Group Number 1, 2, or 3	Material Group Number 1, 2, or 3
External surfaces of ducts for HVAC systems	Material Group Number 1, 2, or 3	Material Group Number 1, 2, or 3
Acoustic treatment and pipe insulation within airhandling plenums in sleeping uses	Material Group Number 1, 2, or 3	Material Group Number 1, 2, or 3

C3—FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE (continued)**Provisions**

(b) floor surface materials in the following areas of *buildings* must meet the performance criteria specified below:

Limit on application

Area of building	Minimum critical radiant \dot{A}_{ux} when tested to ISO 9239-1: 2010	
	Buildings not protected with an automatic fire sprinkler system	Buildings protected with an automatic fire sprinkler system
Sleeping areas and exitways in <i>buildings</i> where care or detention is provided	4.5 kW/m ²	2.2 kW/m ²
Exitways in all other <i>buildings</i>	2.2 kW/m ²	2.2 kW/m ²
<i>Firecells</i> accommodating more than 50 persons	2.2 kW/m ²	1.2 kW/m ²
All other occupied spaces except <i>household units</i>	1.2 kW/m ²	1.2 kW/m ²

(c) suspended flexible fabrics and membrane structures used in the construction of *buildings* must have properties resulting in a low probability of injury or illness to persons not in close proximity to a *fire source*.

C3.5 *Buildings* must be designed and constructed so that fire does not spread more than 3.5 m vertically from the *fire source* over the external cladding of multi-level *buildings*.

C3.6 *Buildings* must be designed and constructed so that in the event of *fire* in the building the received radiation at the *relevant boundary* of the property does not exceed 30 kW/m² and at a distance of 1 m beyond the relevant boundary of the property does not exceed 16 kW/m².

C3—FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE (continued)

Provisions

C3.7 External walls of *buildings* that are located closer than 1 m to the *relevant boundary* of the property on which the *building* stands must either:

- (a) be constructed from materials which are not *combustible building materials*, or
- (b) for *buildings* in importance levels 3 and 4, be constructed from materials that, when subjected to a radiant flux of 30 kW/m², do not ignite for 30 minutes, or
- (c) for *buildings* in Importance Levels 1 and 2, be constructed from materials that, when subjected to a radiant flux of 30 kW/m², do not ignite for 15 minutes.

C3.8 *Firecells* located within 15 m of a *relevant boundary* that are not protected by an automatic *fire* sprinkler system, and that contain a *fire load* greater than 20 TJ or that have a floor area greater than 5,000 m² must be designed and constructed so that at the time that firefighters first apply water to the *fire*, the maximum radiation flux at 1.5 m above the floor is no greater than 4.5 kW/m² and the smoke layer is not less than 2 m above the floor.

C3.9 *Buildings* must be designed and constructed with regard to the likelihood and consequence of failure of any *fire safety* system intended to control *fire* spread.

Limit on application

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.

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 m² 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.

C5—ACCESS AND SAFETY FOR FIREFIGHTING OPERATIONS

Provisions

FUNCTIONAL REQUIREMENT

C5.1 *Buildings* must be designed and constructed so that there is a low probability of firefighters or other emergency services personnel being delayed in or impeded from assisting in rescue operations and performing firefighting operations.

C5.2 *Buildings* must be designed and constructed so that there is a low probability of illness or injury to firefighters or other emergency services personnel during rescue and firefighting operations.

PERFORMANCE

C5.3 *Buildings* must be provided with access for fire service vehicles to a hard-standing from which there is an unobstructed path to the *building* within 20 m of:

- (a) the firefighter access into the *building*, and
- (b) the inlets to automatic fire sprinkler systems or fire hydrant systems, where these are installed.

C5.4 Access for fire service vehicles in accordance with clause C5.3 must be provided to more than 1 side of *firecells* greater than 5,000 m² in floor area that are not protected by an automatic fire sprinkler system.

C5.5 *Buildings* must be provided with the means to deliver water for firefighting to all parts of the *building*.

C5.6 *Buildings* must be designed and constructed in a manner that will allow firefighters, taking into account the firefighters' personal protective equipment and standard training, to:

- (a) reach the floor of fire origin,
- (b) search the general area of fire origin, and
- (c) protect their means of egress.

Limit on application

Performance requirements in clauses C5.3 to C5.8 do not apply to *backcountry huts*, *detached dwellings*, within *household units* in *multi-unit dwellings*, or to *outbuildings*, and *ancillary buildings*.

C5—ACCESS AND SAFETY FOR FIREFIGHTING OPERATIONS (continued)

Provisions

C5.7 *Buildings* must be provided with means of giving clear information to enable firefighters to:

- (a) establish the general location of the *fire*,
- (b) identify the *fire safety systems* available in the *building*, and
- (c) establish the presence of *hazardous substances* or process in the *building*.

C5.8 Means to provide access for and safety of firefighters in *buildings* must be designed and constructed with regard to the likelihood and consequence of failure of any *fire safety systems*.

C6—STRUCTURAL STABILITY

Provisions

FUNCTIONAL REQUIREMENT

C6.1 Structural systems in *buildings* must be constructed to maintain structural stability during *fire* so that there is:

- (a) a low probability of injury or illness to occupants,
- (b) a low probability of injury or illness to *fire service personnel* during rescue and firefighting operations, and
- (c) a low probability of direct or consequential damage to adjacent *household units* or *other property*.

PERFORMANCE

C6.2 Structural systems in *buildings* that are necessary for structural stability in *fire* must be designed and constructed so that they remain stable during *fire* and after *fire* when required to protect *other property* taking into account:

- (a) the *fire severity*,
- (b) any automatic fire sprinkler systems within the *buildings*,
- (c) any other active *fire safety systems* that affect the *fire severity* and its impact on structural stability, and
- (d) the likelihood and consequence of failure of any *fire safety systems* that affect the *fire severity* and its impact on structural stability.

C6.3 Structural systems in *buildings* that are necessary to provide firefighters with safe access to floors for the purpose of conducting firefighting and rescue operations must be designed and constructed so that they remain stable during and after *fire*.

C6.4 Collapse of building elements that have lesser *fire resistance* must not cause the consequential collapse of elements that are required to have a higher *fire resistance*.

9. The acceptable solution was also revised at this time and is now presented as an acceptable solution for the particular purpose Risk group.

Table 1.1 Risk groups and Acceptable Solutions				
	Acceptable Solution	Risk group	Applies to	
Amends 2 and 3	C/AS1	Buildings with sleeping (residential) and outbuildings	SH	Houses, townhouses and small multi-unit dwellings Outbuildings
Amend 3 Jul 2014	C/AS2	Sleeping (non institutional)	SM	Permanent accommodation eg, apartments Transient accommodation eg, hotels, motels, hostels, backpackers, refuge shelters Education accommodation
Amend 3 Jul 2014	C/AS3	Care or detention	SI	Institutions, hospitals (excluding special care facilities), residential care, rest homes, care in the community houses and homes, medical day treatment (using sedation), detention facilities (excluding prisons)
	C/AS4	Public access and educational facilities	CA	Crowds, halls, recreation centres, public libraries (<2.4 m storage height), cinemas, shops, personal services (eg, dentists and doctors except as included above, beautician and hairdressing salons), schools, restaurants and cafes, early childhood centres
Errata 1 Feb 2013	C/AS5	Business, commercial and low level storage	WB	Offices (including professional services such as law and accountancy practices), laboratories, workshops, manufacturing (excluding foamed plastics), factories, processing, temperature controlled storage (capable of <3.0 m storage height other than some limited areas in processing areas) and other storage buildings capable of <5.0 m storage height (except some limited areas <8.0 m to the apex), light aircraft hangars
Amend 3 Jul 2014	C/AS6	High level storage and other high risks	WS	Warehouses (capable of □ 5.0 m storage height other than some limited areas, see C/AS5), temperature controlled storage (capable of □ 3.0 m storage height other than some limited areas, see C/AS5), trading and bulk retail (□ 3.0 m storage height)
	C/AS7	Vehicle storage and parking	VP	Vehicle parking – within a building or a separate building

CAS2 as an example states

Part 3: Means of escape

CONTENTS
3.1 General principles
3.2 Number of escape routes
3.3 Height and width of escape routes
3.4 Length of escape routes
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3.6 Open paths
3.7 Special cases of open paths
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3.9 Exitways
3.10 Control of exitway activities
3.11 External escape routes
3.12 This paragraph deliberately left blank
3.13 Single escape routes
3.14 Special conditions
3.15 Doors subdividing escape routes
3.16 Signs

3.1 General principles

3.1.1 All buildings shall have means of escape from fire which include escape routes. An escape route (see Figure 3.1) shall provide protection to any occupant escaping to a safe place from a fire within a building.

3.1.2 The components of an escape route, in ascending order of protection, are the open paths, exitways (these may comprise smoke lobbies and safe paths), and final exits (see Figure 3.1). Two or more of these components will be necessary, depending on the total travel distance. An escape route shall not pass from a higher to lower level of protection in the direction of escape.

3.1.3 Provided the allowable lengths of open paths are not exceeded, an escape route may comprise only an open path and final exit.

3.1.4 Escape routes shall comply with NZBC D1. Ramps, stairs, ladders, landings, handrails, doors, vision panels and openings shall comply with Acceptable Solution D1/AS1.

This format makes

assessments somewhat easier with the means of escape from fire for example is now part 3 of

the acceptable solution and includes fire separations such as 3.9.5 (but this is not all fire separations)

3.9.5 Safe paths shall be separated from each other, and from all spaces by:

- a) Fire separations, or
- b) If they are external to the building, by distance or appropriate construction (see Paragraph 3.11).

An acceptable solution is a deemed to comply solution under the building Act. These are prescriptive documents that are based on history and experience in NZ together with standards accepted in the industry. They may not be verifiable solutions but stand as acceptable standards. They are understood to be worst case solutions that are robust and allow for a range of designs and complexity and choice of materials. They have inherent contingency in them.

It is a mistake to consider a failure to comply with a prescriptive requirement of an acceptable solution as a breach of a code clause. The worst that should be said is that non compliance means that the solution cannot be relied on to demonstrate compliance. A breach requires evidential basis for failure of a performance criteria of a relevant code clause or at least a likelihood that this will occur.

In this way there is a significant separation between a failure to comply with an acceptable solution and the point that this becomes a breach of the code clause.

S17 for example requires building work to comply with the building code but this does not mean comply with an acceptable solution unless it is referenced under s20 as the only solution. This provision has yet to be invoked in NZ.

Likewise s40 makes it an offence for a person to be carrying out building work except in accordance with a building consent (and an offence not to unless exempted under s41).

There is no offence attributed to a failure under s17.

When considering a failure of means of escape the same distinctions need to be applied.

10. S112

The Building Act 1991 s8 specifically excluded existing building from compliance with the building code. This was not stated in the 2004 Act but is reflected in the powers of council and parts of the Act. S112 provides the exception and applies when an owner elects to apply for a building consent for alterations to an existing building. S112 limits council power to require certain work to be done.

The intention of s112 was to capture buildings with inadequate means of escape (fire alarms and escape routes) and get those critical features into buildings to make them safer not capture the minor defects in recent work. Having said that every prudent builder and owner would address any

issues they find in the course of the work but this shouldn't be the driver for the work in the first place.

This is no different from the owner who elects to maintain compliance by diligent repairs and maintenance and the decision remains with them.

The section protects owners of buildings from council demands to upgrade and makes upgrade optional and the prerogative of the owner. Unless dangerous or insanitary definitions apply (in which case work to make not dangerous or insanitary is the limit of council power. Apart from this the council cannot determine or require a scope of work.

Alterations to existing buildings

112 Alterations to existing buildings

(1) A building consent authority must not grant a building consent for the alteration of an existing building, or part of an existing building, unless the building consent authority is satisfied that, after the alteration,—

(a) the building will comply, as nearly as is reasonably practicable, with the provisions of the [building code](#) that relate to—

(i) means of escape from fire; and

(ii) access and facilities for persons with disabilities (if this is a requirement in terms of section 118); and

(b) the building will,—

(i) if it complied with the other provisions of the [building code](#) immediately before the building work began, continue to comply with those provisions; or

(ii) if it did not comply with the other provisions of the [building code](#) immediately before the building work began, continue to comply at least to the same extent as it did then comply.

(2) Despite subsection (1), a territorial authority may, by written notice to the owner of a building, allow the alteration of an existing building, or part of an existing building, without the building complying with provisions of the [building code](#) specified by the territorial authority if the territorial authority is satisfied that,—

(a) if the building were required to comply with the relevant provisions of the [building code](#), the alteration would not take place; and

(b) the alteration will result in improvements to attributes of the building that relate to—

(i) means of escape from fire; or

(ii) access and facilities for persons with disabilities; and

(c) the improvements referred to in paragraph (b) outweigh any detriment that is likely to arise as a result of the building not complying with the relevant provisions of the [building code](#).

The exceptions are Means of Escape from Fire and Disabled access. The other clauses only need to continue to comply with the other clauses to the extent they comply already. The meaning of this clause has been settled law by determination 2003-10

Disabled access and facilities generally only applies to public building and is not considered here.

Upgrade of Means of escape from fire certainly means install escape routes in a building that does not have them and this is a common problem with polder building built before even the most basic fire requirements were required. It is arguable that it should even be considered where compliance has been considered and designed for post 1992 and the building code considered because there must be a basic level of compliance. When smoke alarms were introduced as mandatory this was included in means of escape to capture existing dwellings in NZ.

11. What does Means of Escape from fire mean? What are the means?

“Means of escape from fire”, is a defined term and this must be referred to and inform the subsequent interpretation and conclusions.

means of escape from fire, in relation to a building that has a floor area,—

- (a) means continuous unobstructed routes of travel from any part of the floor area of that building to a place of safety; and
- (b) includes all active and passive protection features required to warn people of fire and to assist in protecting people from the effects of fire in the course of their escape from the fire

The passive warning features are the alarms and passive features to protect people from the effects of fire in the course of their escape from the fire are those associated with the means of escape. That is the fire separations that form the escape route if they are there but not the fire separations that satisfy other clauses such as spread of fire and protection of other property.

The effect of a defined term means that where this term is used in the act the meaning must be applied. The meaning of “means of escape from fire” must be something less than all the fire clauses or it would simply say this and the need to define the means would not be required.

The key in my view is to understand that the consideration is to the “means” that allow the escape

It does not include all the fire clauses but only that related to the means of escape from fire. If it meant all the fire separations it would say this, if it meant all fire separation it would not have to state in the course of their escape from the fire (or it could just say “from the fire”)

Passive fire separations associated with the Means of Escape only need to be considered, these include the fire walls that form a safe path, and fire and smoke doors in that path. It includes the fire alarms that warn people of the fire and allow them to make their escape including smoke detectors required to protect sleeping spaces but which many existing properties lack.

S112 also considers means of escape from fire.

It states;

(1) A building consent authority must not grant a building consent for the alteration of an existing building, or part of an existing building, unless the building consent authority is satisfied that, after the alteration,—

- (a) *the building will comply, as nearly as is reasonably practicable, with the provisions of the [building code](#) that relate to—
means of escape from fire*

If there are provisions identified that don't comply then (b) applies

- (b) *the building will,—*
- (ii) *if it complied with the other provisions of the [building code](#) immediately before the building work began, continue to comply with those provisions; or*
 - (ii) *if it did not comply with the other provisions of the [building code](#) immediately before the building work began, continue to comply at least to the same extent as it did then comply.*

This means that if the building didn't comply with the building code before the alteration it doesn't have to after but that the work cannot make it worse. This requirement to upgrade means of escape only applies to the means of escape clauses and not all the clauses such as protection of other property and vertical and horizontal spread and surface finishes (except for the finishes in the escape route perhaps).

Surface finish is a contentious area as smoke generated from a fire can intrude into escape path but then it is perhaps not the clear unobstructed path and no longer the escape route from fire. This issue needs further consideration. In my view only surface finishes in a safe path should be considered in respect to means of escape as the fire (and its affects) in other parts of the building are what we are escaping from.

12. What does “As Nearly as Reasonably Practicable” (ANARP) mean?

(yet to be considered.....)

The requirement to meet the current requirements is allowed a discretion under 'as nearly as reasonably practicable' (ANARP) and provides wriggle room for reasonable grounds and uncertainty as well as recognising that inadequate means of escape would be addressed when a building consent was applied for. .

13. Specified systems and passive fire features

When specified systems are present and a compliance schedule is triggered the IQP responsible for annual checks must also consider means of escape. This includes the passive features associated with that means of escape. Recent MBIE guidance documents have confused this and created ambiguity

These state that fire separations are prescribed as specified systems in the Building Regs 2005. This is strictly not correct the regs state that;

15,Any or all of the following systems and features, **so long as they form part of a building's means of escape from fire, and so long as those means also contain** any or all of the systems or features specified in clauses 1 to 6, 9, and 13:

- (a) systems for communicating spoken information intended to facilitate evacuation; and
- (b) final exits (as defined by clause A2 of the [building code](#)); and
- (c) fire separations (as so defined); and
- (d) signs for communicating information intended to facilitate

evacuation; and
(e) smoke separations (as so defined).
(emphasis added)

1 to 6, 9 and 13 includes ;

Schedule 1 Specified systems

- 1 Automatic systems for fire suppression (for example, sprinkler systems).
2. Automatic or manual emergency warning systems for fire or other dangers (other than a warning system for fire that is entirely within a household unit and serves only that unit).
3. Electromagnetic or automatic doors or windows (for example, ones that close on fire alarm activation).
4. Emergency lighting systems.
5. Escape route pressurisation systems.
6. Riser mains for use by fire services.
9. Mechanical ventilation or air conditioning systems.
13. Smoke control systems.

So passive features only need to be considered for a compliance schedule where they **form part of the means of escape** and they involve a building with a specified system noted in 1-6, 9 and 13 above.

There has been a move to include all fire separations as they indirectly provide protection from fire and allows an occupant time to escape but this is the function of alarms in their property. Neighbours are protected by “other property” and “vertical and horizontal spread provisions” and these are not these are not the means of escape (unless they actually form the “means’ (provide safe paths etc)). Fire separations associated with open paths by their nature are not dependent on fire separations for their performance. Concerns related to

This misinterpretation (that all fire separations need to be considered because they are always in the means of escape or ‘we need to protect people at the start of their escape as well’) is becoming a prevailing view and was expressed in recent MBIE determination 2016-048 Shirley Rd.

(<https://www.building.govt.nz/assets/Uploads/resolving-problems/determinations/2016/2016-048.pdf>)

This was expressed as a consensus among experts that was not necessarily the case. The issue was not discussed in detail in this determination and the meaning of

means of escape not considered (except for reference in appendix). This is a serious omission

A higher court ruling is needed to clarify and uphold the correct meaning of means of escape and relationship of fire separations to these means. Until the law is settled the issue is live and open to question. There is always danger that poor decisions set the bar and to some extent this is what happened with leaky homes with very few decisions actually compliance based but often predicated on the assumption that the code required "that building shall not leak".

14. Reasonable Grounds meaning;

Recently this was the subject of submissions during the course of the appeal against the determination 2015/073 (Huhana Davis –Auckland Council CIV 2015 004 1721) where we argued that council had not established reasonable grounds to issue a NTF.

The council legal submission included the following argument;

- 9.7** The requirement in s 164, for the responsible authority to *consider on reasonable grounds* that a specified person is contravening or failing to comply with the Act, requires a credible basis for the responsible authority's view. The Court of Appeal considered a similar phrase, "reasonable grounds to believe", in *R v Williams* in the context of s 198 of the Summary Proceedings Act 1957, determining:²¹

[213] Having "reasonable grounds to believe", the test under s 198 of the Summary Proceedings Act, is a higher standard to meet than "reasonable ground to suspect", the test under s 60(1) of the Arms Act for example (see *R v Karalus* (2005) 21 CRNZ 728 (CA) at para [27]). Belief means that there has to be an objective and credible basis for thinking that a search will turn up the item(s) named in the warrant (see [*R v Laugalis* (1993) 10 CRNZ 350 (CA)] at pp 354 – 355), while suspicion means thinking that it is likely that a situation exists. The issuing officer must hold the view that the state of affairs the applicant officer is suggesting actually exists (see [*R v Sanders* [1994] 3 NZLR 450 (CA)] at p 461).

9.8 The Environment Court considered the phrase "reasonable grounds" in *Britten v Auckland Council* in the context of s 322(4) of the Resource Management Act 1991, which prevents the issue of an abatement notice unless an enforcement officer has reasonable grounds for believing that any of the requisite circumstances exist. The Court held that determining "reasonable grounds do not mean compelling grounds or certain grounds, but grounds which are reasonable."²²

9.9 In our submission, and on the basis of the above authorities, there must be an objective and credible basis on which the responsible authority forms a view that a specified person is contravening or failing to comply with the Act, but there do not need to be compelling or certain grounds for the responsible authority to be justified in issuing a notice to fix.

We accept this understanding of reasonable grounds and it should be consistently applied to all instances when this threshold is referenced in the Building Act.

It follows that in the case of the issue of a CCC that the basis for issuing there must be an "objective and credible basis" but this does not have to be compelling or certain grounds to be justified for issuing a CCC. In other words; the grounds for issuing a CCC are satisfaction on "reasonable grounds" and not "certainty or some absolute proof".

This should be understood as based on the inspections that a council inspector is expected to undertake and supported by the inspections at different stages of construction. It can not be an invasive destructive investigation that no owner would tolerate in a new building.

It follows that this can be a relatively low level of satisfaction but a CCC could not be issued if there was evidence of failure or objective non-performance or evidence of failure on a visual inspection.

Members of the New Zealand Building Surveyors Institute, RCIS and other experts have considerable skill and experience in assessing performance and damage in existing dwellings. This is founded on recent leaky homes assessments that established invasive inspections with destructive investigation as the basis for their evidential reports.

The high level of proof required to establish damage scope of repair for a legal claim are not appropriate to the quite different test for the issue of a CCC or a building consent. This is because absolute proof of performance is impossible without removing all the cladding and seeing all the areas to verify what has been happening. This is a critical factor in council actions that has been poorly argued in leaky claims but I am not responsible for the strategies run in councils defence to date but we do live with the legacy of short-sighted legal opinions that now manifest as risk averse policies.

Is it reasonable for a council inspector to undertake a comprehensive invasive investigation to establish performance (or non conformance)?

15. Conclusion;

Defects and imperfect construction is not evidence of a code breach unless this can be demonstrated that it compromises the code clause to such an extent that the performance criteria cannot be satisfied. This test is to the building and not the building element. While compliance with an acceptable solution gives confidence in that satisfaction non conformity with an acceptable solution requires a further assessment of the building and its particular attributes. Acceptable solutions are worst case solutions. While I accept that this higher level of assurance certainly satisfies compliance it is to a very high level and certainty this is not the level required for “reasonable grounds”. The uncertainty that remains in all construction and inherent in any design for whatever code clause must be subject to common sense and a proper risk assessment of what is reasonable and likely.

In terms of the fire clauses the performance criteria are now very quantitative and require an analytical approach based on science which is not easily undertaken. But an assessment must at least include the factors that mitigate the concerns that may be present. This is particularly the case with matters relating to means of escape from fire which is required to be considered under s112 and the passive features such as fire separations and warning systems associated with that Means of Escape.

A proper appreciation for what constitutes is ‘means of escape’ is required to properly inform the inspection of fire separations that are associated with specified systems and part of compliance schedules.

We experts are criticized as much for what we miss as for what we may see. While a building surveyor may hit the money because he knows the likely places for failure it is very difficult to establish an affirmation of certainty in performance.

In other words we are able to prove non compliance with discrete evidence but “proving” compliance is impossible without significant damage to the cladding to prove “it isn’t broke”. This lack of certainty and doubt is the domain of normal maintenance and an owners ongoing duty to maintain compliance (at their own risk).

Another complication is the concept of future likely damage allowed for in the WHRS act that while intended to cover inevitable damage from current leaks was at times allowed to be no more that future likely leaks with ‘likely’ based on expert opinion difficult to refute. It also gave licence for the hidden defects yet to be discovered (or not).

A breach of compliance must in return be an evidential basis that is more than just the possibility of non compliance but must demonstrate a likelihood of failure of the code clause. This is different from the reasonable grounds that a council is only required to establish but for a contravention to occur the breach must be quantifiable and evidentially based.

The test of non compliance must then also involve an evaluation of whether the reasonable grounds of satisfaction existed and the failure of compliance that if it falls into the area of certainty must become the responsibility of the current owner as part of normal maintenance and regular maintenance required to maintain the level of compliance that the owner requires as their

prerogative under the building act. This cannot be imposed on an owner and it follows if an owner chooses to upgrade then this should not fall to other parties in proceedings.

This same evaluation should be made to s112 and means of escape which must be based on proper interpretation of what 'means of escape from fire' means but also allows for imperfect construction and uncertainty as long as the building is not dangerous.

This must be the basis of any claim also.

(This discussion paper is a work in progress and will be updated from time to time....Nov 2017)