Technical decision

Subject	Interconnected smoke alarm installation for alterations to existing residential buildings		
TD number	TD004	Release date	8/11/2024
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Review period	Annual/as required		
Code clauses	C4, F7		
Reference documents	C1/AS1, F7/AS1, section 112 Building Act 2004		

Summary

Requirements for smoke alarms in household units changed from 1 November 2024 following revisions to acceptable solutions C/AS1, C/AS2, F7/AS1, and verification method C/VM2.

The acceptable solutions now define a Type 1 smoke alarm system as being an interconnected system, which can be mains-powered or wireless.

Selwyn District Council interprets that as part of compliance with section 112 of the Building Act 2004 applications for alterations to household units are required to:

- upgrade to interconnected smoke alarms in line with NZS 4514:2021 and the updated acceptable solutions or,
- demonstrate that any deviation from full compliance is justified under as nearly as reasonably practicable (ANARP) which must consider the benefits versus costs specifically in relation to the building being altered.

This approach is expected to meet MBIE intentions of significantly reduce fire-related injuries and fatalities by ensuring early detection and warning in the event of a fire.

Background

The Ministry of Business, Innovation and Employment (MBIE) consulted on Acceptable Solutions C/AS1, C/AS2, F7/AS1, and Verification Method C/VM2 to improve the safety of people from fire.

As a result, amendments were made to the acceptable solutions and the verification method to align fire safety system requirements with the latest industry standards. A 12 month transition period applied from 1 November 2023.

To support the new requirements MBIE have sponsored free access to the new versions of the relevant standard on Standards New Zealand's website.

Technical considerations

Alterations and Compliance with Building Act 2004 section 112

Whenever a building undergoes alterations under a building consent, the building must comply *"as nearly as is reasonably practicable"* (ANARP) with the provisions of the building code that relate to means of escape from fire and access for disabled persons (where applicable).

The acceptable solutions define a Type 1 smoke alarm system as:

- a single smoke alarm or multiple interconnected alarms, each with a smoke detector and sounding device, and
- complying with NZS 4514:2021, and
- alarms include a hush button for temporary silence during false alarms.

To meet compliance, two types of interconnected smoke alarm systems are permissible:

- Mains-powered interconnected system
    - A system hardwired into a 230 VAC power source that includes a non-removable backup battery to function during power outages.
    - A registered electrician must install this.
- Wireless interconnected system
    - A system powered by a sealed, non-removable battery with a minimum lifespan of 10 years.
    - Homeowners or contractors can install this, provided they follow the manufacturer's instructions and ensure proper placement in accordance with NZS 4514:2021.

ANARP explained

The concept of ANARP acknowledges that, while it may not always be feasible to achieve full compliance with the building code during alterations, the building must be upgraded to the highest extent possible without imposing unreasonable or disproportionate costs or disruptions on the building owner.

Concerning smoke alarms, this means:

- If no compliant smoke alarms are currently installed, an interconnected smoke alarm system must be installed as part of the alteration, as this is a straightforward and cost-effective safety upgrade.
- The applicant must demonstrate why full compliance (i.e. installation of an interconnected smoke alarm system) is not reasonably practicable if they are seeking to justify a reduced compliance level.

Factors to consider under ANARP for smoke alarms

When assessing whether upgrading to interconnected smoke alarms is reasonably practicable, the following factors should be considered:

- Nature and extent of the alteration work

Major alterations that significantly change the building's structure or use are more likely to require full compliance. In contrast, minor alterations (e.g. cosmetic changes or small-scale addition) may warrant a lesser degree of upgrade.

- Cost and disruption versus life safety benefit

  The cost of upgrading to interconnected smoke alarms is considered modest in comparison to the significant life safety benefit they provide. Installation of wireless systems is usually minimally invasive.

- Type of building and occupant risk

  Dwellings with single escape routes where people could be separated from an exit by the fire (e.g. where there are internal stairs or long corridors) should consider upgrading to an interconnected system, even for minor alterations, due to the heightened risk in such situations.

Justification for not upgrading

Where an application seeks to avoid upgrading to interconnected smoke alarms, it must provide a detailed justification explaining why the upgrade is not reasonably practicable.

The building consent authority (BCA) will assess the justification and determine whether it meets the ANARP requirements under section 112 of the Building Act 2004.

Justification should include:

- a cost-benefit analysis comparing the costs of upgrading the smoke alarm system with the potential life safety benefits, and
- a description of the current smoke alarm system including locations and type, its age, and functionality, and
- the extent of the alteration work and whether it affects escape routes or increases fire risk.

For example, the applicant may argue that the existing smoke alarm system installed less than 5 years ago still has significant service life remaining, and that the alteration involves only minor work (e.g. adding a sanitary fixture) without increasing fire risk or escape route length.

In this case, the BCA may deem it unnecessary to upgrade to an interconnected system.

Installation costs and practicality

Installing a compliant interconnected smoke alarm system is now more practical and affordable due to advancements in wireless technology. They are readily available.

A typical wireless system for a three-bedroom dwelling can be retrofitted for an estimated $400 – $600, including alarms and labour.

Hardwired systems may incur higher installation costs but provide reliable mains power with a battery backup for periods of outage.

Decision/outcome

A home or any of its associated buildings where there is sleeping, that is undergoing alterations under a building consent must comply *"as nearly as is reasonably practicable"* (ANARP) with the provisions of the building code that relate to means of escape from fire

Compliance via C/AS1 will require :

- an acceptable solutions Type 1 smoke alarm system that is a mains-powered interconnected system or wireless interconnected system, or
- not upgrading can be justified by satisfying ANARP requirements.

Review requirements

Decision review will consist of a check for:

- Any updates to the affected acceptable solutions, New Zealand standards and relevant legislation.

Review log

Review date	Who	Revisions