



Position Statement Fire and Smoke Stopping Methodology

PFPS-02 Version 1.0 – Issued: 07/08/20



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Fire Protection Association New Zealand
Position Statement PFPS-02
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Version 1.0 – Issued: 07/08/20



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NOTE:

Where AS1530/ AS4072 are referenced these specifically refer to

- AS1530 (part 4)
- AS4072 (part 1)



Introduction

- › Compliance with the New Zealand Building Code (NZBC) can be demonstrated using various pathways. This position statement is intended to highlight one methodology to address fire stopping to meet the NZBC.
- › This document is primarily intended to be used by the passive fire specialist undertaking the design and detailing of new fire stopping as well as the Building Consent Authority (BCA) to assist their approval of the fire stopping solution.

Note that this document is not intended to specifically detail the compliance methodology of existing fire stopping solutions where an 'as nearly as is reasonably practicable' (ANARP) justification is to be used. An ANARP assessment, occurring each time consentable works occur, needs to consider the building specific life safety sacrifices and benefits of remediating a deficient fire stopping design.

Discussions with the BCA may result in retaining the fire stopping deficiency as-is, improving it to a certain extent, or upgrading it to achieve full Building Code compliance.

Previous determinations are publicly available to help clarify the ANARP approach, specifically determinations 2008/006, 2008/016, 2008/004, 2009/027, 2009/070, 2009/079, 2009/117, 2010/004, 2010/028, 2010/043.

Note that determinations are building-specific and must be formalised through Building Consent with the BCA.

The NZBC compliance options for fire stopping are noted to be either 'Deemed to Comply' Acceptable Solutions or 'Alternative Solutions' also known as specific or performance-based design. For further information, refer to the FPANZ Position Statement addressing these approaches.

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Fire and Smoke Stopping Design Methodology

- ▶ The methodology is intended to be a guide to help develop knowledge about the building's fire or smoke separations so appropriate stopping can be designed and documented. This methodology should facilitate construction phase works.
- ▶ This methodology would normally be applied prior to the Building Consent submission. It would usually be undertaken by a person experienced and competent in fire and smoke stopping – for example a fire engineer, architect, a passive fire design specialist or passive firestop contractor.

1. Determine location and performance requirements of all fire separations (x/x/x) and smoke separations (-/-/Sm) to meet the Building Code fire requirements.

Confirm if other client or regulatory compliance requirements will impact on the design of the fire and smoke separations (eg. Insurance, property protection, HSNO). Actively review this design detail periodically throughout the project duration to maintain accuracy of this information (design coordination).

Communicate this information to the design team on plans and sections.

2. Determine the relevant fire and smoke rated substrate (walls, floors, ceilings) construction details (eg. Material type, thickness).

Actively review this design detail periodically throughout the project duration to maintain accuracy of this information (design coordination).

3. Determine the details of the gaps and services to be placed within the fire and smoke separations design coordination with other disciplines).

Actively review this design detail periodically throughout the project duration to maintain accuracy of this information.

Completing the above steps may require site inspections to verify the site specific details and the development of new/ updated and accurate design (drawing) information.

4. Based on this information, determine if any Alternative Solution or ANARP stopping details will be required. To facilitate this, a review of Product Registers should be undertaken (eg. **FPANZ Passive Fire Product Register**). Seek guidance/information from fire and smoke stopping manufacturers/suppliers as required.

When relevant, refer to FPANZ Position Statement PFP003 regarding Alternative Solutions. Alternative Solutions should only be explored when all compliant avenues with tested solutions have been exhausted including alterations to the design and/ or scenario.

Product Registers help to identify:

- ▶ Manufacturers/suppliers who may have products to enable compliant stopping to be undertaken
- ▶ Which gaps, services or substrate combinations may have no or limited options to meet AS1530 / AS4072

5. If required, seek or develop stopping details which will enable appropriate and compliant construction to be undertaken. Alternatively, discuss redesign options for the gap, service or substrate to enable AS1530 or AS4072 compliant solutions. For coordination purposes, communicate this information to the design team. (Simple designs expected to comply with AS1530/AS4072 may not require



Design Methodology *cont.*

details beyond a performance-based solution).

6. Liaise with the relevant design stakeholders

to agree the level of documentation to be provided for all stages of the fire and smoke stopping works. Agree if the works will require a Building Consent. (Existing buildings) Agree the extent of any remedial stopping works considered appropriate on ANARP grounds.

7. If relevant, **review buildability of the stopping solutions.** This may result in design optimisation/rationalisation.

8. **Complete fire design documentation** to identify how appropriate and compliant construction details are to be achieved. A 'fire and smoke stopping specification' is recommended to cover this design the contractual expectations of the contractor(s) is recommended. Identify any relevant construction phase work to spot check the installations (including inspections and destructive testing) and sign-off expectations. Typical design documentation would include:

- a. The location and performance requirements of all fire and smoke separations (plans and sections) - see item 1 above
- b. The relevant design, quality assurance, documentation, inspection and signoff expectations.
- c. (If relevant) Any non AS1530/AS4072 design details to be followed.

Remove possible fire/smoke stopping documentation conflicts possibly found in the specification of other design disciplines.

Submit this information to the BCA and the tenders / contractors.

Completing a fire and smoke stopping solutions register is recommended to clarify the details of each system planned for the building (refer to Attachment A).

These eight steps represent the design methodology.

Should it be agreed that construction monitoring is to occur, FPANZ recommend the following tasks:

9. **Undertake construction monitoring**, unless agreed otherwise by the design stakeholders, to spot check that the completion of the fire and smoke stopping work on-site is in accordance to the original design details. Issue any relevant sign-off documentation. Key elements of this work by the 3rd party inspector are likely to include:
 - a. Initial contractor briefing meeting (see ref 1)
 - b. Review of contractor's design submissions prior to installation (see attached 'Fire and Smoke Stopping Solution Register' example)
 - c. Regular site inspections to spot check the installations

[ref 1]

This meeting is to occur well before the installation of fire/smoke stopping is to occur and possibly before walls/floors are built. This meeting should clarify roles and responsibilities, the contractor methodology, sub-trade coordination, possible 'construction phase design' elements, quality and documentation expectations to occur onsite. It would set timeframe for contractor design submissions so to permit 3rd party review before work occurs onsite. The possible need for (and scope of) destructive testing is to be clarified.



General Tips

The following information is intended to highlight some general tips to the passive fire designer:

- 1.** There are typically limited fire stopping design options for the following construction materials
 - a. fire rated plasterboard ceilings
 - b. 'thin' (<120mm) concrete floors
 - c. 'thin' composite floor systems
 - d. timber
 - e. single layer plasterboard wall systems
 - f. insulated wall panel systems
 - g. specialist hydraulic and mechanical pipe materials
 - h. penetration of structural members
- 2.** Fire stopping systems are usually designed for perpendicular service penetrations
- 3.** Service bends should be kept clear of the wall/floor (eg. 100mm) to enable the installation of a fire/smoke stopping system.
- 4.** Where single layer plasterboard wall systems are proposed, local patching using plasterboard or a Mineral fibre sheet (or similar) can typically be used to meet the fire stopping system installation requirements. Alternatively, the wall system would need to be changed to match the 'as tested' arrangement. Local plasterboard patching details are available from multiple manufacturers. Some Manufacturers do have sufficient testing on single layer plasterboard walls.
- 5.** Some key elements of fire stopping system installation details include:
 - a. min-max annular gaps requirements
 - b. maximum percentage fill limits
 - c. minimum mastic depth requirements
 - d. fastener type for collars
- 6.** Unless confirmed by the product manufacturer, product substitution is not permitted.
- 7.** Fire/smoke stopping design submissions are to be specific to the building in question. System data sheets alone may be insufficient evidence of how a compliant installation is to occur (ie. The information needs to reflect the type and sizes or gaps and services to be used in the building).
- 8.** Acoustic design details may be in conflict with the fire/smoke stopping requirements, both in the products to be used onsite and the construction details. Design coordination should occur to address this possible conflict.
- 9.** Seismic details including clearances between service & wall substrate maybe in conflict with the fire/smoke stopping requirements, both in the products to be used and the construction details. Design coordination should occur to address this possible conflict.
- 10.** Unless confirmed by the product manufacturer, tested systems are to be installed fully as tested, even if the fire performance required is less than achieve in the fire test unless expressly permitted by the product manufacturer. For example, a -/120/120 rated system on a metal pipe shall not delete any insulation wrap even if only a -/30/- performance is required.



General Tips *cont.*

11. Info to request from other designers (eg. architect and building services engineers)

To assist the fire and smoke stopping designer as they determine how the gaps and services placed within the fire and smoke separations are to be fire stopped, typically questions they may ask other designers may include (but not limited to):

- 】 Service type (eg. Hot water supply)
- 】 Material type and size range (eg. Ø20-30mm OD copper pipe)
- 】 Will material type change along the length of the service (eg. from combustible pipe to non-combustible pipe)?
- 】 To pass through internal walls? Yes/No
- 】 To pass through internal floors? Yes/No
- 】 Floor system or wall lining thickness?
- 】 Any applied covering to service? (eg. lagging, insulation)
- 】 Any coupling with other services? (ie. multi-service penetrations)
- 】 Any need to accommodate movement or thermal expansion?
- 】 How are the services to be supported? (eg. Screwed to ceiling mounted brackets)
- 】 Structural / seismic: what degree of movement is to be accommodated?
- 】 Acoustic: what methods are planned to limit sound transfer?
- 】 Any Durability (NZBC B2) requirements needed (eg. stainless steel collars)?

Further Information



For further reading, please refer to the following documents:

1. FPANZ PFPS-01 - Introduction to Passive Fire Protection
2. FPANZ PFPS-03 - Fire Stopping: Deemed to Comply and Alternative Solutions
3. FPANZ PFPS-04 - Smoke Stopping
4. FPANZ Passive Fire Products Register, available from www.fpanz.org
5. Guide to Passive Fire Protection in Buildings. BRANZ Ltd. 2017 available from www.branz.co.nz
6. Ministry of Business, Innovation and Employment, Acceptable Solutions C/AS1 and C/AS2 and Verification Method C/VM2
7. NZBC C1 – C6 & B2
8. AS1530 Part 4: 2005: Methods for fire tests on building materials, components and structures - Fire-resistance tests of elements of building construction
9. AS4072 Part 1: 2005: Components for the protection of openings in fire-resistant separating elements - Service penetrations and control joints Amend: 1
10. AS/NZS1668.1: 1998: The use of ventilation and air conditioning in buildings, Part 1: Fire and smoke control in multicompartment buildings Amend: 1
11. NZQA Level 3 Passive Fire Installers Qualification (Competenz) www.competenz.org.nz

Fire and Smoke Stopping Solution Register

Table 1 - Fire and Smoke Stopping Solution Register (TEXT EXAMPLE ONLY)

Passive Fire Solution No.	Orientation	Onsite Substrate Description	Onsite Service Penetration Description	Required Fire Rating (x/x/x) and Smoke Rating	Fully Compliant (AS1530/AS4072) or Alternative Solution	Proposed Passive Fire Products	Achieved Fire Rating (x/x/x) and Smoke Rating	Comments	Information Links (and attachments)