

## The new passive fire protection landscape in Australia

By John Rakic; I hope you get something relevant from this warning of the turmoil coming post May 1, 2022.

### Synopsis

**NCC2022 is all but here; do you know what all the fuss is about and what other NCC changes have been implemented pertaining to FRL's?**

This article is a MUST read for all those participating in passive fire protection in Australia; whether you are a developer, builder, project manager, contract administrator, services engineer, strata manager, architect, designer, fire protection consultant, manufacturer or suppliers of fire stopping materials, a regulator, a building surveyor, certifier or the like.

It discusses the changing landscape of passive fire protection driven by recent and proposed changes to the NCC, coupled with the pro-active approach taken by leading construction companies because they were quite frankly fed up with the expensive mess they were continually having to clean up pertaining to protection of openings in as built buildings.

It sets out the challenges for the so-called Passive Industry sector; that is for manufacturers and suppliers, resellers of products, designers, installers, certifiers and those doing inspection and testing of existing buildings. As Trafalgar, my company, we have got onto the front foot, to respond positively to the challenges right here and now, and the ones we see ahead, but sadly, many manufacturers, suppliers and even installers are stuck in the past, (in the old way of doing things) and I can see a very hard time ahead for them, if they do not get very busy, very quickly. For many it will be a rude awakening and both an expensive and possibly company destroying experience. Watch this space!

### A quick overview of passive fire protection

Passive Fire Protection involves dividing buildings or parts of building into fire containment zones, whereby if a fire starts in one zone, the fire compartment barriers, are designed, built (and hopefully maintained) to stop the fire spreading from one zone to another.

So called fire rated walls, floors, ceilings, shafts and the like , and all the openings like doors, windows, and those for services which pass through these fire barriers, need to be fire tested and have suitable fire testing documentary evidence to prove they can provide a requisite FRL (or FRR for my Kiwi friends).

Passive Fire Protection isn't the hardest fire protection subject area to grasp, but somehow at least here in Australia, just like waterproofing for example, we seem to make a big mess of it too often.

### How is was Passive Fire Protection in the 1990's?

I want to start by discussing how it was, so I can articulate to readers how it is today, of course where I see it going and why. Sorry for the run, down memory lane but it is fun to reminisce at times!

## James Hardie

My first exposure to Passive Fire Protection was as part of my role at James Hardie as a much younger Engineer. James Hardie in the late 1980's had created an R&D joint venture with a UK company called Cape; together they worked on asbestos free building board technology which saw the introduction of wood pulp, or cellulose as the backbone of both fibre cement and calcium silicate board technologies. I worked on the development of some fire rated duct systems, using a product we were making at James Hardie called HardieTherm700, and I was involved in some sliding fire door fire tests with same product.

We had not long had the first Building Code of Australia published, which I had purchased and studied, and I had my own copy of AS1530 Part 4 which I had read from front to back, several times.

I remember driving over to North Ryde to the Experimental Building Station, having completed a Sponsored Investigation agreement, getting a fire test completed and receiving my first fire test report, SI 0075 or a number something like this.

To me, as an Engineer it seemed to make sense. The Regulations, in each State & Territory, had adopted the BCA1990 as its technical provisions for construction of buildings. There were many so called primary and secondary referenced Australian Standards, which formed part of the BCA's technical provisions.

In terms of building control, it was explained to me, by an old James Hardie fellow employee, that the Council and their Building Surveyors acted as the Building Control Police to make sure builders and sub-contractors did the right things; well at least in terms of Passive Fire Protection. I also remember being told that the Fire Brigade did some inspections too.

## Tyco / Wormald

A few years later, I found myself at Tyco Building Products, which was the new name for an old and well known, market leading division of Wormald, called Wormald Building Products. Here I got a baptism of fire pardon the pun, I had to do fire testing of both fire doors and openings for service penetrations. Not long after having completed by MBA, I became the Commercial Manager for Passive Fire Protection.

It was here that I learnt my first regulatory enforcement or lack of regulatory enforcement lesson pertaining to passive fire protection.

The old BCA, called up an FRL, based on fire testing to AS1530 Part 4, which for service penetrations included both the integrity and insulation (temperature rise on non-fire side) criteria. I knew we had achieved both integrity and insulation, the latter by use of steel mesh systems known as FyreGUARDS, InsulGUARDS and FyreSPRINGS. No one was putting them on, and no one, that is no council seemed to care?

We fielded so many technical questions about service penetrations for cables and pipes in those early days, and it was apparent that it was impossible to fire test every configuration, and this saw the development and publication of AS4072.1 – 1992, which in retrospect was ahead of its time globally. It documented some STANDARD cable and pipe configuration, which if fire tested with a specific fire stopping material(s), provided a so-called field of application, to simplify the fire testing and certification process.

At this time also, I drew the short straw, and was asked and agreed to start my Masters in Fire Safety Engineering. I wasn't even sure why, but my senior management said we needed to have someone doing it to understand what it is and how it might impact the fire protection industry.

## **BCA1996 – Welcome to the world of Performance!**

1996 saw the adoption for the first time in Australia of a Performance Based Building Code. Yes, this was the start of Alternative Solutions, the introduction and formalisation of so called Deemed-to-Satisfy (dts) provisions, and the birth of Fire Safety Engineering here locally.

What happened sometime over the pursuing years, was we privatised Building Control and we saw independent or privately owned Certification companies, and so called “Certifiers” appear. The Principal Certifier or Certifying Authority was the trendy new name for the old and degree qualified Building Surveyor.

These changes were spawned or sponsored by what was BOMA in its day which is today, the PCA. The lowest hanging fruit initially was passive fire protection, and a new breed of mavericks, which is the best way to describe them in these immature days of Alternative Solutions, started trying to carve out passive fire protection and save their client, the developer, some money.

There was some requisite push back I seem to recall; enter what was the PFPA and with the fire services, insurers and wider industry some controls were put in place; yes, it was worse once upon a time. I also recall the publication of the first Fire Engineering Design Guidelines by the Fire Code Reform Centre around this time.

## **NCC**

Many of you will know, that the Building Code of Australia, is now called the National Construction Code (of Australia).

Sadly, it was a period of 25 years or more from 1990 onwards, whereby there was little or no changes or improvement made to Fire Resistance and specifically to Section C of both the BCA and later the NCC. This pertains to both Verification methods and of course the dts provisions.

The ABCB pretty much said industry can sort itself out via Alternative Solutions in terms of fire, whilst we regulators need to look at (and did look at) things like Acoustics, Legionella, Energy (yes Section J was born), etc

The worldwide cladding pandemic, yes, I think this pandemic arrived before COVID19 pandemic, and saw some very necessary NCC improvements. Hopefully this continues as the deemed-to-satisfy provisions and many of the referenced Australian Standard are getting tired.

Let's take a look at what the happenings are right now in passive fire protection.

## RECENT CHANGES TO NCC IN AUSTRALIA AND THE IMPACT ON FRL'S

There are two significant changes to the NCC relating to the determination of FRL's by way of fire testing and by way of what was often referred to as "fire assessments" or "formal letters of opinion" previously.

### Variations to fire tested prototypes

The first significant change was introduced in NCC 2019 I seem to recall, and can be found by looking in both of the following parts of the NCC, which I have taken the liberty of snipping and including in this article:

#### Schedule 5 – Fire-resistance of building elements

##### Fire-resistance of building elements

#### Schedule 5 Fire-resistance of building elements

##### 1. Scope

This Schedule sets out the procedures for determining the FRL of building elements.

##### 2. Rating

A building element meets the requirements of this Schedule if—

- (a) it is listed in, and complies with [Table 1](#) of this Schedule; or
- (b) it is identical with a prototype that has been submitted to the [Standard Fire Test](#), or an equivalent or more severe test, and the FRL achieved by the prototype without the assistance of an active fire suppression system is confirmed in a report from an [Accredited Testing Laboratory](#) which—
  - (i) describes the method and conditions of the test and the form of construction of the tested prototype in full; and
  - (ii) certifies that the application of restraint to the prototype complied with the [Standard Fire Test](#); or
- (c) it differs in only a minor degree from a prototype tested under (b) and the FRL attributed to the building element is confirmed in a report from an [Accredited Testing Laboratory](#) which—
  - (i) certifies that the building element is capable of achieving the FRL despite the minor departures from the tested prototype; and
  - (ii) describes the materials, construction and conditions of restraint which are necessary to achieve the FRL; or

## Clause C3.15 – Openings for service installations

### Fire resistance

#### *Deemed-to-Satisfy Provisions*

#### **C3.15 Openings for service installations**

Where an electrical, electronic, plumbing, mechanical ventilation, air-conditioning or other service penetrates a building element (other than an *external wall* or roof) that is *required* to have an FRL with respect to *integrity* or *insulation* or a *resistance to the incipient spread of fire*, that installation must comply with any one of the following:

(a) **Tested systems**

- (i) The service, building element and any protection method at the penetration—
- (A) are identical with a prototype assembly of the service, building element and protection method which has been tested in accordance with AS 4072.1 and AS 1530.4 and has achieved the *required* FRL or *resistance to the incipient spread of fire*; or
  - (B) differ from a prototype assembly of the service, building element and protection method in accordance with Section 4 of AS 4072.1.

So, what can you see when you read these new parts of the NCC; that is both Schedule 5 and Clause C3.15?

A few things stick out for me and have been discussed in detail by myself, my technical team and many in industry of late

- Firstly, FRL's for protection of openings for service penetrations, under the deemed to satisfy provisions can only be determined by an Accredited Testing Laboratory; that is an organisation accreditation for conducting fire testing to AS1530 Part 4
- NOTE 1- We have seen some organisations without NATA certification or mutual recognition to NATA, preparing reports for FRL's for openings protecting service penetrations. Sadly, they are misleading the manufacturers and suppliers of these materials who think they have compliant and deemed to satisfy documentation; they don't meet the dts.
- NOTE 2 – For our American friends, Engineering Judgements performed by the Manufacturer are not acceptable under the NCC deemed to satisfy provisions
- Variations from fire tested prototype assemblies must be of a **minor nature** and be **MUST** now be prepared in accordance with Section 4 of AS4072.1
- For each minor variation the materials, construction and conditions of restraint necessary to the FRL must be clearly provided, and these must be based on one or more Standard Fire Tests and must be justified with **sound technical arguments**.

Historically, so called “letters of opinions” or “report pertaining to variations from test prototypes” could be very short and only take into consideration AS1530 Part 4, ignoring the requirements outlined in AS4072 Part 1. Many older assessments, or even some new assessment which do not adequately list the minor variations, and discuss the fire test data and rationale for proposing an FRL, and of course those that do not reference and taking into consideration Section 4 of AS4072 Part 1, are openly being rejected by Certifier and Building Surveyor alike. These new “assessment” reports from Accredited Testing Laboratories that do comply with the new NCC requirements are verbose and take some skills to read. At Trafalgar we have prepared detailed technical manuals to complement our fire testing and field of application assessments. These can all be viewed on [www.tfire.com.au](http://www.tfire.com.au)

## Age of fire tests reports

The second significant change was introduced in/or around NCC 2017, and relates to the currency or age of fire test reports, providing an FRL. From May 1, 2022, **old fire tests are finally being effectively retired or made redundant.**

We started doing independent fire test reports here in Australia as early as 1958, under what was then Australian Standard A30, an early version of what is now AS1530 Part 4. As you can appreciate the fire testing requirements have changed significantly from 1958. Older fire test reports have been allowed to be used for determination of an FRL and can still be used for this purpose

For this change a grace period, has been provided and that grace period expires on May 1, 2022.

This is the reason why you might see some manufacturers and suppliers claiming NCC2022 compliance for some passive fire protection systems. We are promoting early NCC2022 compliance at Trafalgar, as we want to support moving forward as an industry and of course safer buildings.

This is a little harder to find these changes in NCC, but they are contained in Schedule 4 of NCC and specifically when one looks at either of AS1530 Part 4 – 2014 and AS4072 Part 1 – 2005 (incorporating Amendment 1).

### Referenced documents

#### Schedule 4 Referenced documents

#### Schedule of referenced documents

The Standards and other documents listed in [Schedule 4](#) are referred to in the NCC.

Table 1 Schedule of referenced documents

AS 1530 Part 4	2014	Methods for fire tests on building materials, components and structures — Fire-resistance tests for elements of construction See <a href="#">Note 2</a>	<a href="#">A5.6, C3.15, C3.16, Spec C1.13, Spec C1.13a, Spec C3.15, Spec D1.12, Schedule 3, Schedule 6</a>	<a href="#">A5.6, 3.7.3.3, Schedule 3, Schedule 6</a>	<a href="#">A5.6, Schedule 3, Schedule 6</a>
AS <a href="#">4072</a> Part 1	2005	Components for the protection of openings in fire-resistant separating elements — Service penetrations and control joints (incorporating amendment 1) See <a href="#">Note 9</a>	<a href="#">C3.15</a>	<a href="#">3.7.3.3</a>	N/A

The devil is in the detail, and the detail is in Note 2 and Note 9, which I have also snipped here for the reader.

- (2) For AS 1530 Parts 1 to 4:
- (a) Until 1 May 2022, subject to the note to AS 4072.1, reports relating to tests carried out under earlier editions of AS 1530 Parts 1 to 4 remain valid.
  - (b) Reports relating to tests carried out after the date of an amendment to a Standard must relate to the amended Standard.
- (9) For AS 4072.1, until 1 May 2022, systems tested to AS 1530.4 prior to 1 January 1995 need not be retested to comply with the provisions in AS 4072.1.

What this means in layman's terms is all fire testing and reports for any minor variations from fire tested prototypes, must be in strictly in relation to the latest version of AS1530 Part 4 – 2014. Yes, this means all old fire tests, which many manufacturers and suppliers have been trading off, some for 60 years or more, will now expire and be redundant, unless the older fire testing conducted has sufficient vigour and data to meet the AS1530 Part 4 – 2014 version of the Standard.

I personally admire the ABCB for taking this stance; but having said that, it is a big ask for manufacturers and suppliers to tidy up their fire testing hence why an extended 5 years of grace period was provided when NCC 2107 first made this change. At Trafalgar we have been very active with fire testing, probably since about as early as 2015, especially in light of the fact that some prominent builders wanting fire testing to the latest version of AS1530 Part 4, well before NCC introduced the NCC2022 deadline for older reports.

## So, what does this all mean to you, the reader?

Passive Fire Protection **should not be anywhere as hard as it is being portrayed** and it should not have the bad publicity it is getting. It is not alone; we have a huge issue in Australia with the Quality of Buildings in my humble opinion. This has been well publicised in NSW and we see David Chandler, the new Building Commissioner (and his trusty mate Reg), take charge from September 1<sup>st</sup>, just a few weeks from today to implement new legislation and reforms to improve the confidence of consumers particularly in relation to new high rise residential apartments.

Previously a few tests were conducted to AS1530 Part 4 and quite a wide field of application was obtained by way of some formal opinions. AS4072 Part 1 was current and played an important part in this process. What was tested for up to 2 or 4 hours, was widely accepted as suitable for 60 and 90 minutes. It is certainly not the case today. Fire testing is required for each wall type and FRL; this manifests itself as fire testing multiple times in different wall types for the same passive fire protection products / systems. One fire test and one old style assessment just does not cut it anymore.

The old days of just saying in your literature things like "Fire tested to AS1530 Part 4 and up to 4 hour fire ratings" are a thing of the past. One could easily argue that without readily available technical manuals and installation instructions; these broad claims as in fact misleading and deceptive conduct; and let's face it when it comes to life safety one would expect better. Should passive fire protection products be sold as commodities at resellers like Bunnings for example. I truly think NOT.....

## What changed to necessitate changes to NCC and specifically for FRL's?

In my opinion, it is the construction of the hundreds and hundreds of high rise residential apartments; trying to stop what some refer to as Urban Sprawl.

This has seen some of the following:

- More wall type that hot meals types

- Hebel
- Walsc
- ProntoPanel
- SpeedPanel
- Dincel
- The advent of very thin single layer plasterboard 60 minute walls which don't really cast well for service penetrations and often need local thickening or patching adjacent to the services
- Of course 90 minute & 120 minute plasterboard walls remain, as do blockwork, brick and tilt up concrete walls

- New service types and then some more and then more

- Copper pipes
- Insulated copper pipes (Section J driven)
- Many new power cable types
- Data cables
- Drink Pythons
- Aquatherm
- PE
- HDPE
- PEX
- PEX-AL-PEX
- Insulated PEX variant are all but here too
- Aluminium core cables
- I have missed heaps I bet!!!!!!!!!!!!!!!!!!!!!!

- A proliferation of services passing from the corridor to apartment fire wall

Split or stand-alone air conditioning, data cables, NBN and more and more!

So.....

This means more and more fire testing is required. Just for the fire rated walls, this means fire testing of all the wall types listed above incorporating all of the different service types, in different quantities and mixtures.

The tragic Grenfell fire in the UK and our own fire at Lacrosse Towers, and the cladding pandemic have seen regulators need to take action; it has seen a much more focussed approach by insurers and for passive fire protection this has resulted in a much more vigilant and careful (yes more conservative) building surveying / certification fraternity.

To us at Trafalgar this has meant, multiple technical engineers to service the enquiries both on site and in the office, and of course a huge fire test bill to cater for all the new wall types, service types and of course our (my) fetish for innovation. Did someone say **FyreBOX**????

Industry is NOW finally asking for and having to learn to read fire test reports and accredited testing laboratories variation from test prototype reports. Many poorly written older style assessments are being rejected which I think is a good thing.

## A FEW WAYS OF DOING THINGS AS A BUILDER AND SOME QUESTIONS TO ASK OF YOUR INSTALLERS AND THEIR MANUFACTURERS AND SUPPLIERS OF PASSIVE PRODUCTS / SYSTEMS

In today's litigious and fast-moving construction environment, one should take heed of this advice offered in good faith to the Australian Construction industry.

I suggest ask yourself these questions pertaining to who you use to do your installations and who they buy off?

- Don't make passive fire protection an after-thought. Get on the front foot and be proactive and this will save you many headaches and money in the longer run
- Look at some new and innovative systems like Trafalgar FyreBOX for example that have been designed to help do things smarter, faster and with visible and improved compliance certainty
- Hire a forward-looking certifier who looks at passive fire protection of openings.
- Build sample walls and shafts on your construction projects for the trades and do not allow substitution of approved products without some documented process
- Take an interest in what product your subbies are using
- Where is they buying their products from?
- What technical support do they have?
- Do they have a technical manager for passive fire products?
- Do they have more than a glossy brochure?
- Do they only say up to 4 hours on their literature? Be wary of this old chestnut
- Look for technical manuals which articulate wall types, service types and FRL's
- Take heed of insulation; that is the third criteria of the FRL
- Are fire test reports and assessment readily available – preferably for easy downloading
- Can you get site support?
- Does the price seem to cheap?
- Is there detailed installation instruction and videos
- Does your gut feeling tell you they just don't know what they are talking about?
- Are they more interested in your power tools or anchor business?
- If it is pink foam – be afraid and REJECT it
- Can you reach them when you need them; day and night?
- Common sense prevails
- Try TRAFALGAR – [www.tfire.com.au](http://www.tfire.com.au) – 1800 888 714 – [technical@tgroup.com.au](mailto:technical@tgroup.com.au)