Fire NZ 2016

CONFERENCE & EXHIBITION

HOW SAFE IS SAFE?

Evolving Fire Safety.

9TH – 11TH NOVEMBER 2016
ASB SHOWGROUNDS
GREENLANE, AUCKLAND

FPA NEW ZEALAND

SFPE
Engineering A Fire Safe World

IFE

Assessing Passive Fire Defects in Existing Buildings

3 Speakers

Ed – Current Issues and A New Way forward?

Ron – What's wrong with my building?

Mike – Case study and putting it into practice!

Purpose of this presentation

- Summarise the extent of the problem as seen by Regulatory Authorities, Designers and Passive Fire Specialists
- Propose a method of assessing the extent of defects early in the design process and agreeing with all stakeholders a repair and upgrade strategy to minimise consent and construction chalenges

Existing buildings - ANARP

- Focus on Reclads
- Increased awareness of passive fire rating problems within the industry it has become apparent, that most, if not all buildings have significant passive fire and other fire related construction defects
- The traditional approach has been to ignore the potential for defects until construction commences
- Designing, documenting and gaining approvals once construction has started generally causes stress and tension between all the parties involved potentially resulting in significant time delays and construction budget overruns
- Due to the time constraints involved there are also limited opportunities to examine a risk based approach to remediation

Outcomes

- Emphasis can go back to the original project objectives rather than refocusing attention onto the passive fire problem
- Anticipating the potential for issues to be uncovered and engaging with passive fire specialists and fire engineers who understand the problem will provide more of an opportunity to take a risk based approach to repair and upgrade strategies
- Recognition that:
  - Not all passive fire defects or building types are equal in terms of the risk to life and property and any approach needs to be tailored to the project specifics
  - Building Act only requires ANARP compliance

This presentation outlines strategies for how this might be undertaken to the satisfaction of all parties along with the use of case studies

Lakanal House Incident – UK 2013

"Passive fire protection is often installed by an allied trade that may not be a 'specialist'. This can lead to inappropriate installation which will not offer the expected smoke and fire performance. On-going maintenance of installed fire protection measures is also necessary since damage can be caused by follow-on trades and, during refurbishments, and fire resistant materials may be substituted with those which do not offer the same protection"

Ref: Association for Specialist Fire Protection

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Passive Fire Protection

Typically Includes

- Fire stopping - Penetration, cavity barrier and linear gap seals
- Protection of structural elements i.e. intumescent coatings, Fire rated board and cladding to structural elements, Fire rated spray materials
- Walls and floors that provide compartments to resist the spread of fire - Partitions
- Walls and roofs/roofing - the building envelope
- Fire rated ductwork systems
- Fire/smoke resisting dampers
- Etc.

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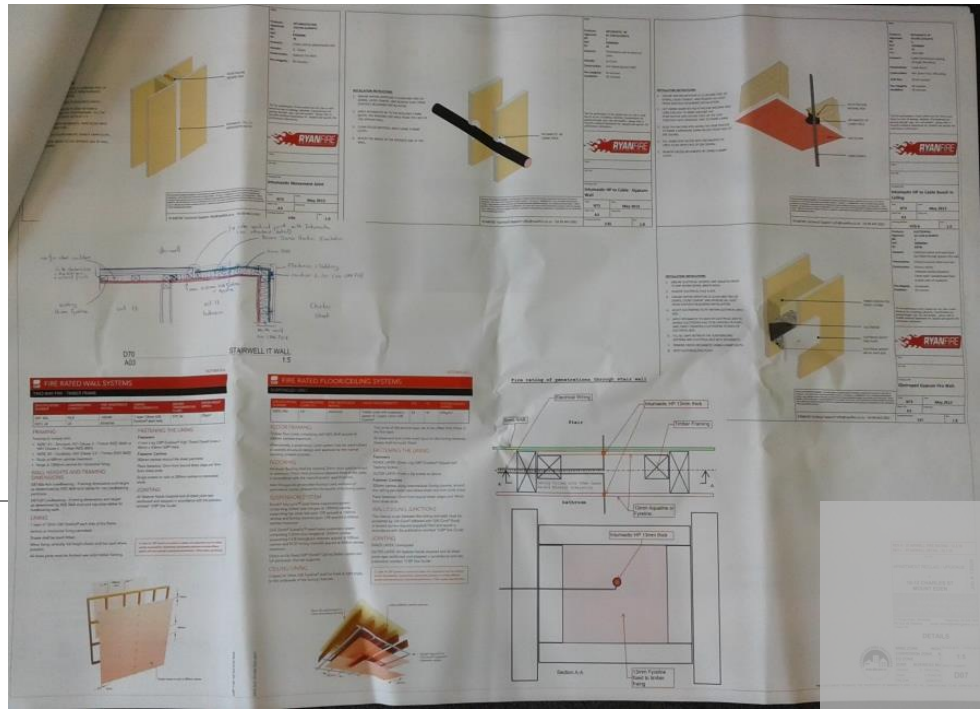
Consent – Plans and Specifications

Large inconsistency between the quality of documentation provided to support the consent application

- ✓ Plans and specifications (incl drawings)
- ✓ Performance specifications
- ? Statements
  - Everything is OK
  - Everything to comply
  - Will check on site!
- ? Nothing - Silence



Opinions

- Consultant 1 – *"well in excess of the requirement"*
  - *Depth recommended 20-25mm*
- Consultant 2 – *"it is reasonable to use 'engineering judgement"*
  - *Depth recommended 30-40mm*
- Consultant 3 – *"…reliance on unsubstantiated statements and "engineering judgement" is not sufficient. No evidence has been provided to indicate that there has been any attempt to follow a formal process in order to derive the opinion presented."*
- Supplier – "*a minimum depth of 25mm"* but with limitations

Spectrum of advice

- *"However, in view of the superior alarm system which offers very early warning of a fire event…"*

In response to a question about the same building being considered 'Dangerous':

- *"The client has proposed the installation of Type 1 smoke alarms as an interim measure to reduce the life safety risk as a matter of urgency"*

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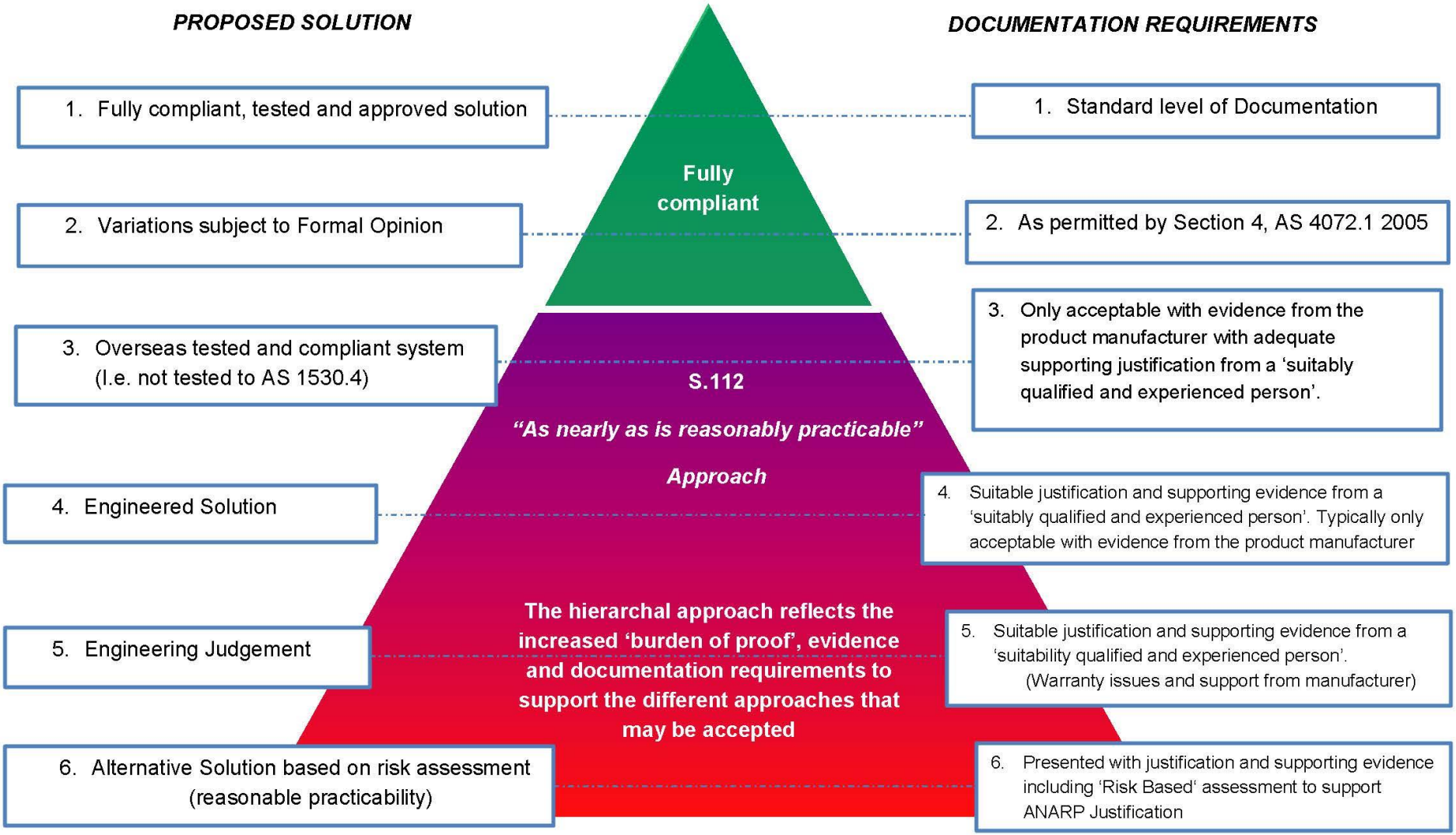
Passive Fire and Smoke Stopping
Hierarchy of Accepted Solutions for Existing Buildings



Determinations

- “there is insufficient evidence to form a view as to compliance of the proposed solution”
- “there is insufficient information on which to make a determination as to the compliance of the building work to the extent required under section 112”
- “…the building after completion of the proposed remedial works would not satisfy the level of compliance required under section 112 of the Act, with respect to the fire separation between the upper level apartments and the warning system for all apartments in the building”

Determination 2016/048

Draft Determination 2823

Auckland Council
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Determinations

- Cant presume the building complies
- Expect there to be non compliances
- S112 – Continued reliance only on costs
  You must present benefits
- Investigating problems - how far do you go?

Cant ignore the Problem!

Determination 2016/048
Draft Determination 2823

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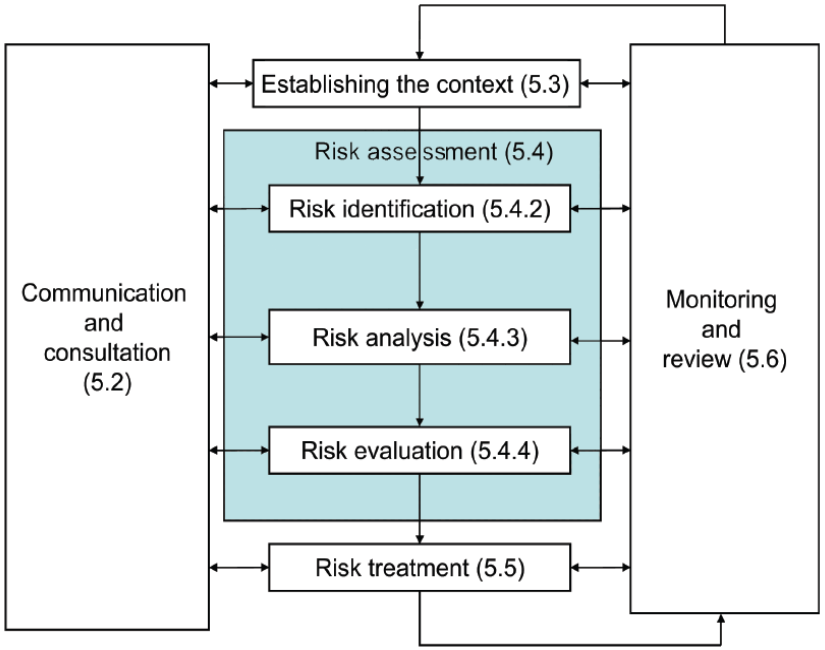
Risk Assessment Approach

- Qualitative and Quantitative Risk Assessment
- Risk management process AS/NZS ISO 31000
- C/VM2 may only be part of the solution to support an outcome/ANARP

To reduce Risk be proactive and recognise that Communication is key!



Passive Fire - Risk/Cost Analysis: **Process**

Assessment Method to determine what is "Practicable and Reasonable" to repair in terms of s.112 of the New Zealand Building Act.

MaynardMarks
PROPERTY & BUILDING CONSULTANTS

Step 1: Assess Risk

Assess the risk to life and property of a passive fire defect, rate 1-5. Factors include size of defect, location in building, level of risk if fire spreads (i.e. major risk to life or minor risk to property).

Step 2: Assess Cost & Time

Assess the cost and difficulty of remediation. Factors include cost/time of repairing defect itself, extent of collateral work required to remediate defect, time costs to project (i.e. will the project's critical path be affected and incur contractor's extension of time and owners' costs for accommodation etc. This will include the effects of

Step 3: Remediation Requirement

Find the remediation requirement on the chart below, by intersecting the Risk column with the Cost & Time row. High and V. Hi require remediation. Medium requires further review from a fire engineer. Low is not practicable and reasonable to

Cost/Time		Risk 5 (High)	4	3	2	1 (Low)
Low	1	V. Hi	V. Hi	High	High	Med
	2	V. Hi	High	High	Med	Med
	3	High	High	Med	Med	Low
	4	High	Med	Med	Low	Low
High	5	Med	Med	Low	Low	Low

Risk Factors

Building Risk

A What is at risk

0.5	Storage/CommercialProperty
1	Sleeping purpose
2	Safe Path/Common Exit
2	Critical Structure

B Proximity to Fire Station

0	Within 5km, manned
1	Within 5km, volunteer or 10km manned
2	Within 5-10km, volunteer
3	>10km

C Construction Type

1	Concrete floors and IT walls
1.5	Concrete floors/timber IT walls
2.5	Timber floors and walls

D Automatic Warning/Suppressi

0.4	Sprinklers
0.8	Interconnected Smoke Alarms
1	Brigade connected alarm
1.2	Alarm with manual call points

Defect Risk

E Size of Defect, Hole etc

1	Small	3	Large Whole wall	8	Whole Ceiling
2	Medium	5			

F Required FRR

1	15 min	3	60 min	6	120 min
2	30 min	4	90 min	8	240 min

G Current Level of Compliance

%	Reduction calc by Passive Fire Engine

H Proximity to Structure

0	Low
1	Medium
2	High

J Ignition Source Within Room

0	None
1	Balcony/Deck
2	Electrical Riser/Distribution/Plant
2	Car Park/Other
3	Commercial Kitchen
4	Domestic Kitchen

K Vertical Spread

0	None
2	Pipe/Cable
10	Stairs/Duct/Shaft

Risk Score

= (A+B+C) x D x (E+F+H+J+K) x (100-G

0 - 6	6 - 12	12 - 19	19 - 25	25 +
1	**2**	**3**	**4**	**5**

Cost & Time Factors

M Builder's Work Required

1	None (defect is completely accessible)
2	Minor (e.g. remove linings only)
3	Moderate (e.g. adjust framing, cabinetry)
4	Major (strip bathroom - multiple trades)

N Total Construction Cost (per defe

1	$0-$1000
2	$1001-2000
3	$2001-$4000
4	$4001-$6000
5	$6001-$8000
6	$8001+

O Additional Time Involved

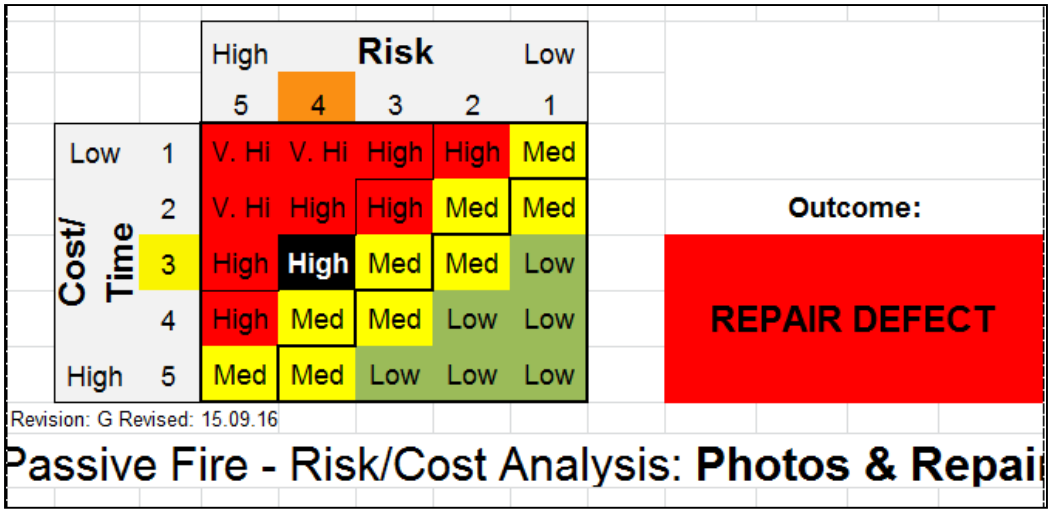
0	None	3	2-3 weeks	6	5-6 weeks
1	< 1 week	4	3-4 weeks	7	6-7 weeks
2	1-2 weeks	5	4-5 weeks	8	7+ weeks

Cost Score

= M + N + O

0 - 2	2 - 4	4 - 6	6 - 8	8 +
1	**2**	**3**	**4**	**5**

Risk Assessment



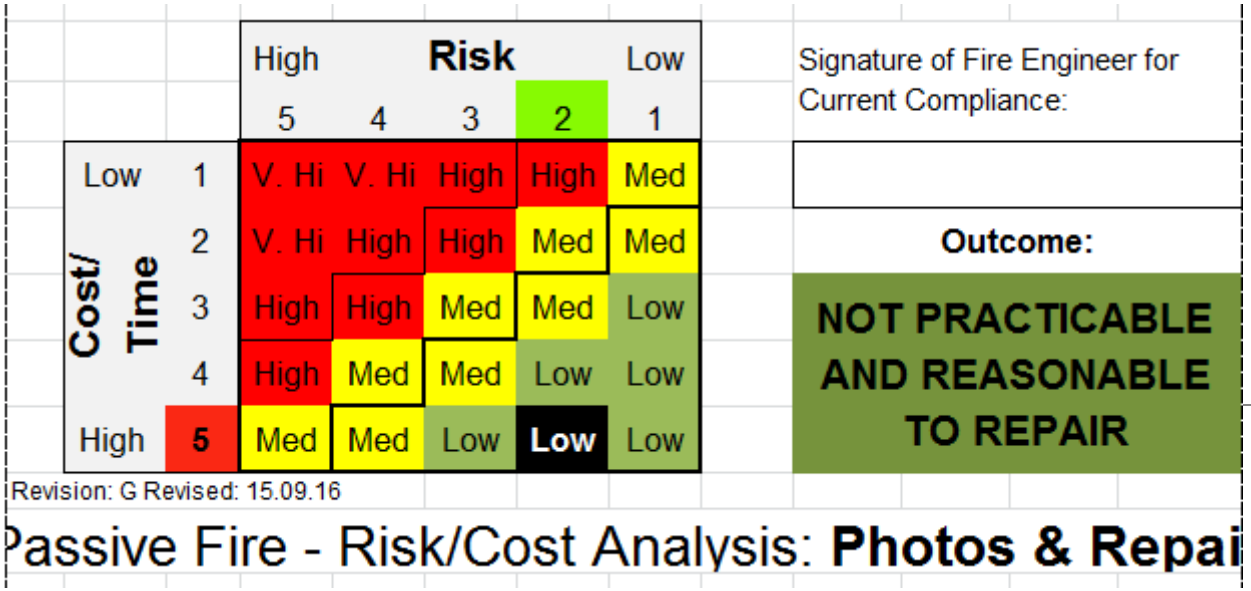
Cost/ Time		Risk: High 5	4	3	2	Low 1
Low	1	V. Hi	V. Hi	High	High	Med
	2	V. Hi	High	High	Med	Med
	3	High	**High**	Med	Med	Low
	4	High	Med	Med	Low	Low
High	5	Med	Med	Low	Low	Low

Outcome:

REPAIR DEFECT

Revision: G Revised: 15.09.16

Passive Fire - Risk/Cost Analysis: **Photos & Repai**



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	2	V. Hi	High	High	Med	Med
	3	High	High	Med	Med	Low
	4	High	Med	Med	Low	Low
High	5	Med	Med	Low	**Low**	Low

Signature of Fire Engineer for Current Compliance:

Outcome:

NOT PRACTICABLE AND REASONABLE TO REPAIR

Revision: G Revised: 15.09.16

Passive Fire - Risk/Cost Analysis: **Photos & Repai**

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Passive Competency

- Qualifications and experience need to be

  'fit for purpose'

- Emergence of the 'Passive Fire Engineer'

- Understand your limitations

- Seek help

Making it up on site

- Overreliance on solving problems during the construction stage
- ANARP may not be available
- Dealing with inspectors
  - Expect full compliance?
  - Don’t rely on them to give you advice, accept products or design detail at the last minute
  - Minor variations vs. consent amendments

  “*any change to fire rated elements requires an amendment*[1]”
  - Designer absence?

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[1]AC2224 - *Amendments and minor variations*

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Next speaker!

- "As we've suspected all along, the same lack of care and attention, and total absence of concern… for future owners, has lead to widespread failure and non-compliance across all aspects of these developments”

  Roger Levie is chief executive of the Home Owners and Buyers Association (HOBANZ)

- “Also in our opinion with the current state of the building and services trade skills including specialist passive fire contractors, 100% compliance of penetrations in fire separations is an unrealistic expectation”