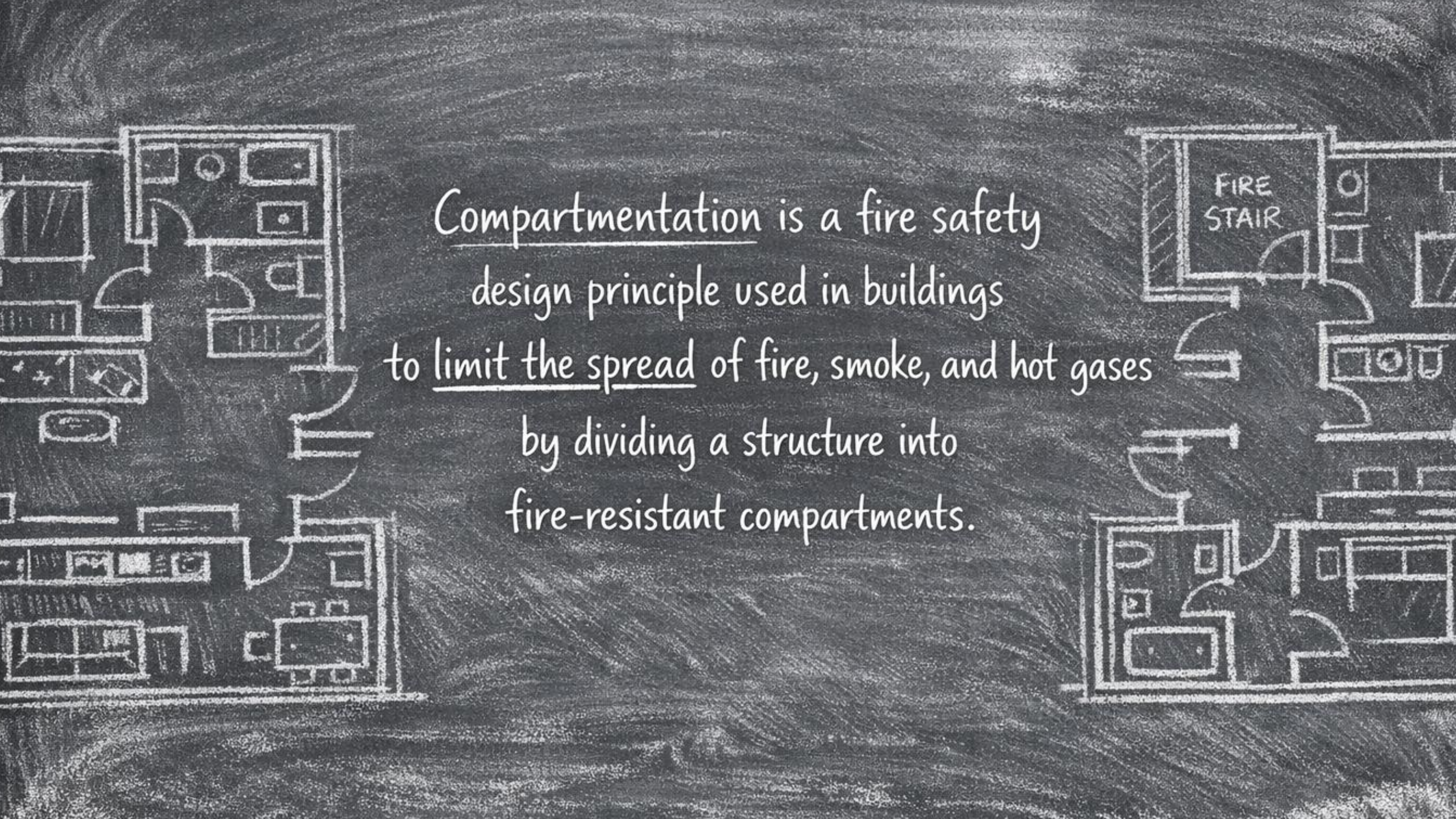
FIREFLY®

When Compartmentation Fails: Real-World Consequences from Grenfell & Hong Kong

Shahid Malimar
National Sales Manager

What is Compartmentation?

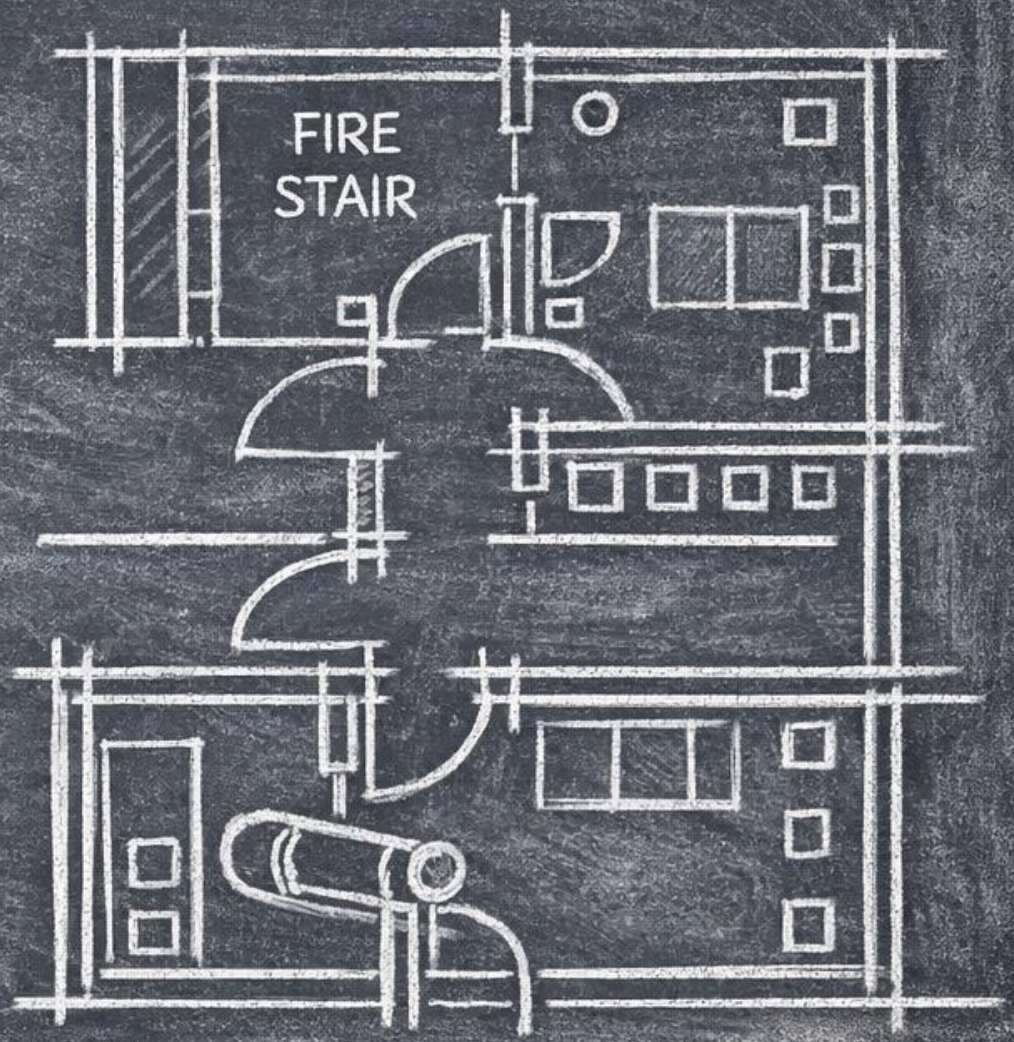


Compartmentation is a fire safety design principle used in buildings to limit the spread of fire, smoke, and hot gases by dividing a structure into fire-resistant compartments.

How compartmentation is achieved

Buildings are subdivided using fire-resisting construction, including:

- Fire-Rated walls, floors & ceilings
- Fire doors
- Fire-stopping of service penetrations (pipes, cables, ducts)
- Fire-Rated shafts

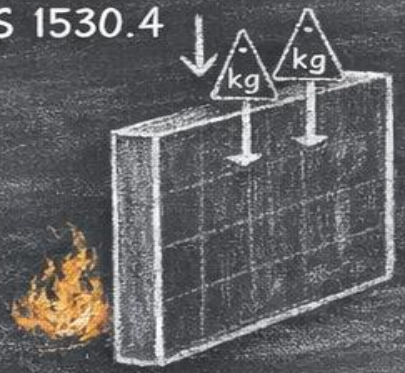


Each compartment is designed to resist fire for a specific time period (e.g, 30, 60, 90, or 120 minutes) known as FRL (Fire Resistance Level).

60 / ~~60~~ / ~~60~~

STRUCTURAL ADEQUACY

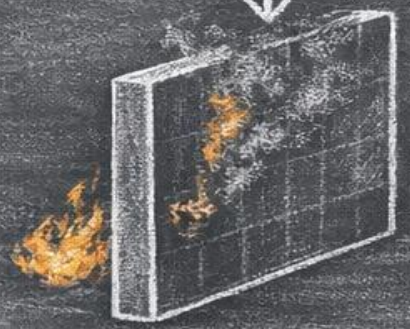
The ability to maintain stability and adequate load-bearing capacity as determined by AS 1530.4



STRUCTURAL ADEQUACY

INTEGRITY

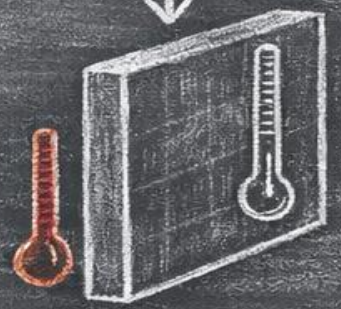
The ability to resist the passage of flames and hot gases as specified by AS 1530.4



INTEGRITY

INSULATION

The ability to maintain a temperature over the whole of the unexposed surface below that specified by AS 1530.4



INSULATION

GRENFELL TOWER

LONDON

JUN ‘17

12:50 am
999 call- Fire in kitchen on 4th floor apartment

1:09 am
Fire spread up the building’s façade on the east face. Stay put advice has been given

1:30 am
Fire reached top floor of the building

2:00 am
Flames are now travelling on the north and east sides of the tower

2:35 am

LFB revoked “Stay Put” advice and residents are to evacuate

3:20 am
100 people are believed to be trapped

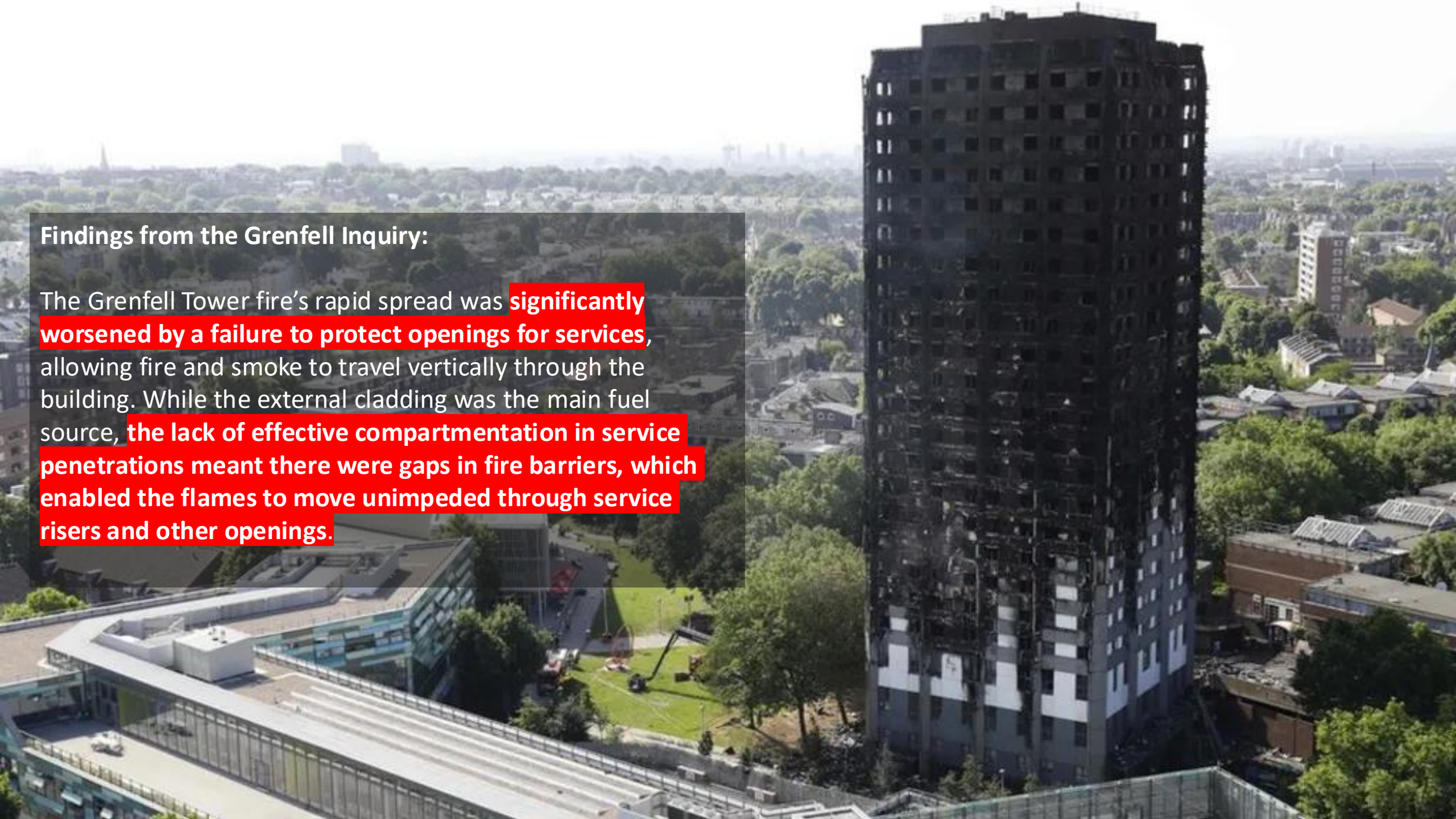
8:07 am- Last survivor evacuated

GRENFELL TOWER

LONDON

JUN ‘17

72 Casualties, aged between 6 months and 84 years



Findings from the Grenfell Inquiry:

The Grenfell Tower fire's rapid spread was **significantly worsened by a failure to protect openings for services**, allowing fire and smoke to travel vertically through the building. While the external cladding was the main fuel source, **the lack of effective compartmentation in service penetrations meant there were gaps in fire barriers, which enabled the flames to move unimpeded through service risers and other openings**.

Impact on Fire Compartmentation:

This breakdown in compartmentation **accelerated the internal spread,** making evacuation and firefighting efforts far more difficult.

Grenfell Tower Inquiry Phase 1 Report:

There was loss of compartmentation due to:
Unsealed or poorly sealed service penetrations between flats and communal areas.
Inadequate fire-stopping around pipes and cables, which **allowed fire and smoke to travel vertically and horizontally**.

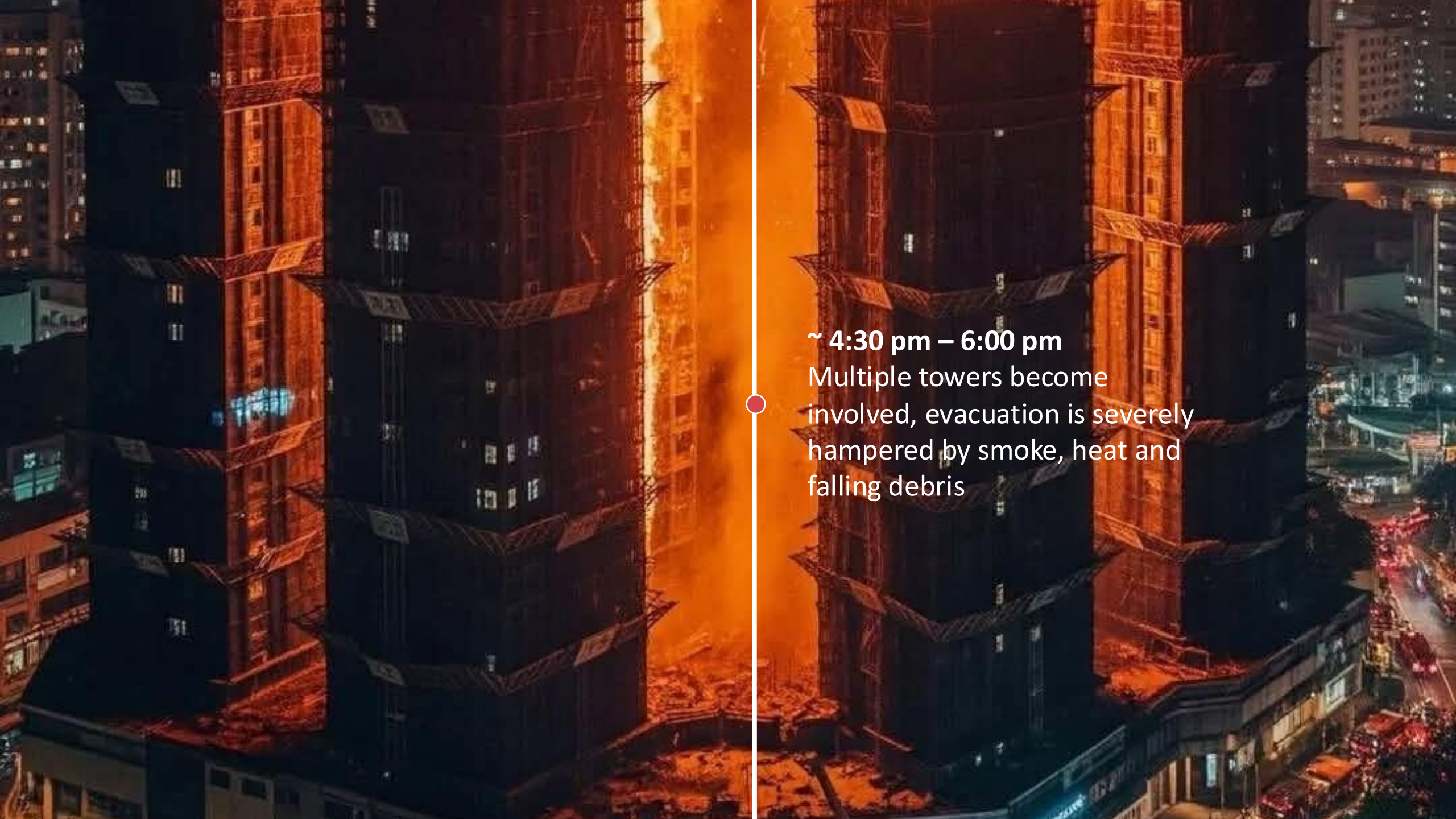
WANG FUK COURT FIRE

HONG KONG NOV ‘25


~ 2:00 pm 26th November
Ignition on lower-level
external cladding

2:51 pm
Fire first reported to Hong Kong FSD, fire fighters arrived within minutes. Fire already climbing rapidly


~ 3:00 pm - 4:00 pm
Fire begins to jump
laterally between buildings



~ 4:30 pm – 6:00 pm
Multiple towers become involved, evacuation is severely hampered by smoke, heat and falling debris

Night of 26th Nov
7 of 8 Towers are burning externally and internally

27th November

Fire Continues to burn through the night and into the next day

Search and rescue operations proceed intermittently as conditions allow

10:18 am 28th November 2025

Fire is officially extinguished after 43 hrs and 27 mins of continuous operations

8 TOWERS AFFECTED

BURNED FOR OVER 43 HRS

168 CASUALTIES

79 INJURED

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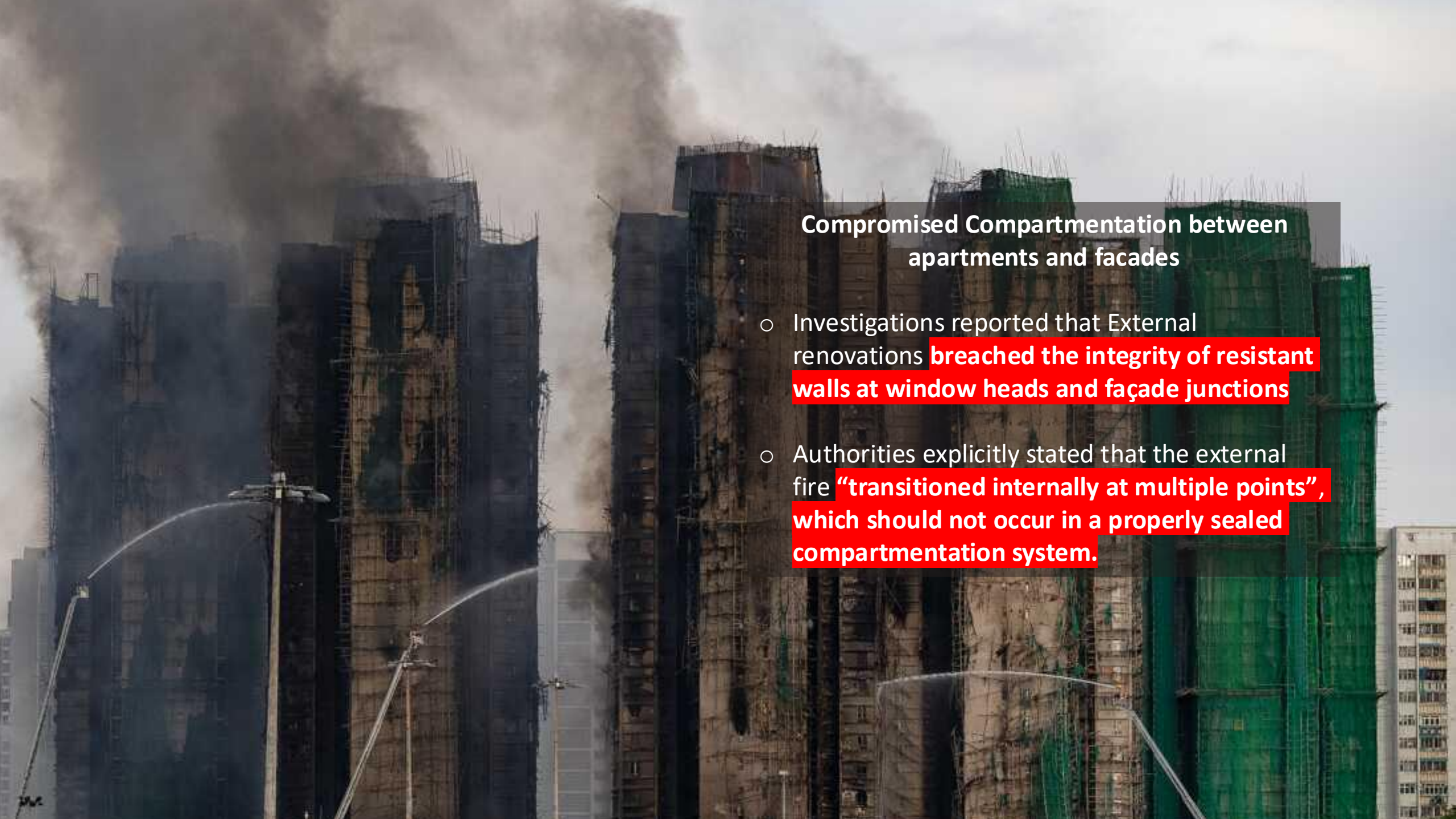
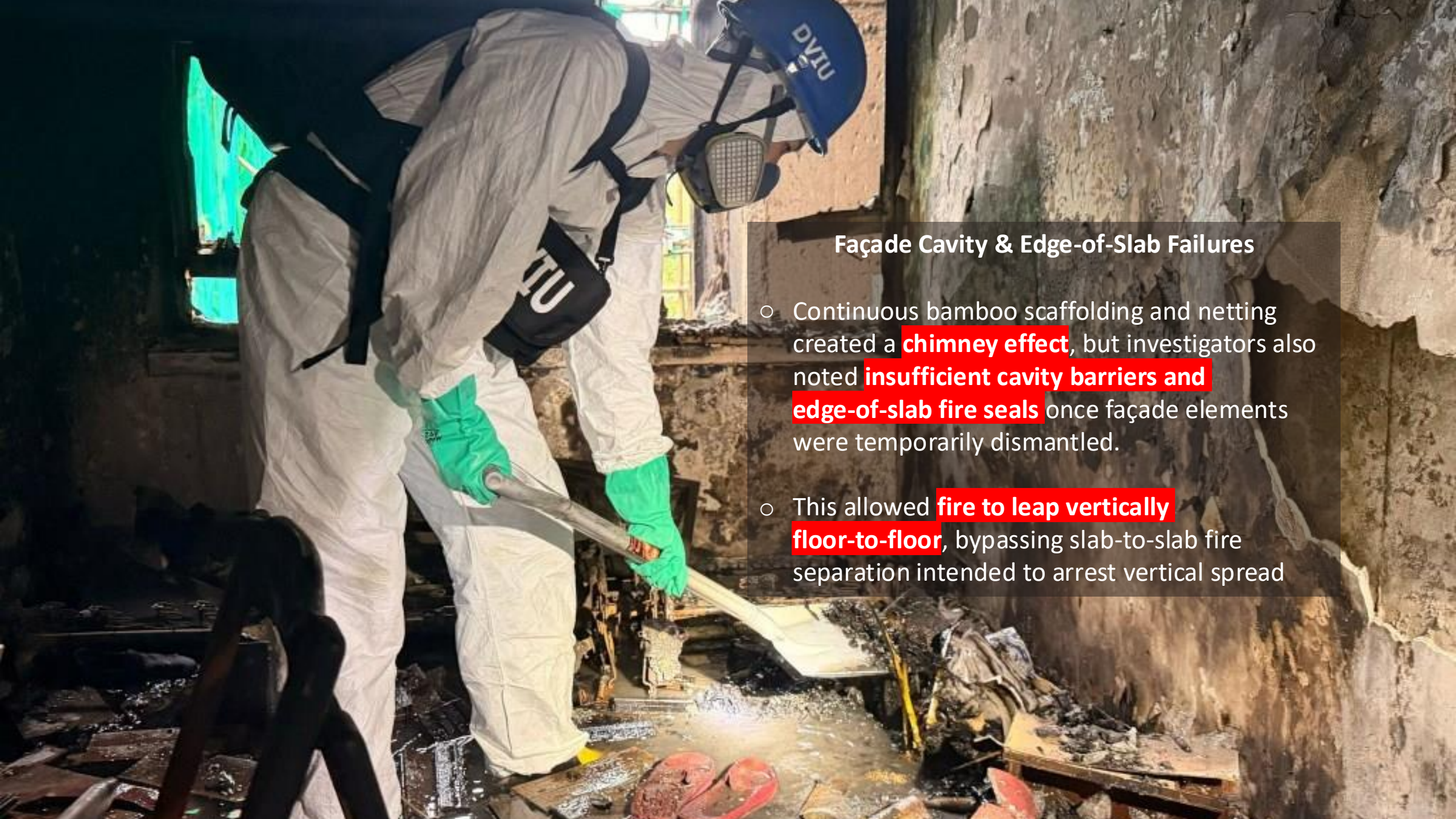


Compromised Compartmentation between apartments and facades

- Investigations reported that External renovations **breached the integrity of resistant walls at window heads and façade junctions**
- Authorities explicitly stated that the external fire **“transitioned internally at multiple points”, which should not occur in a properly sealed compartmentation system.**

Unsealed or Inadequately Sealed Service Penetrations

- Post-incident inspections identified **service risers, window-mounted services, and retrofit cabling penetrations** that were **not adequately fire-stopped** after renovation works.
- While not the ignition source, these unsealed penetrations **materially accelerated untenable conditions inside flats**, especially on upper floors.

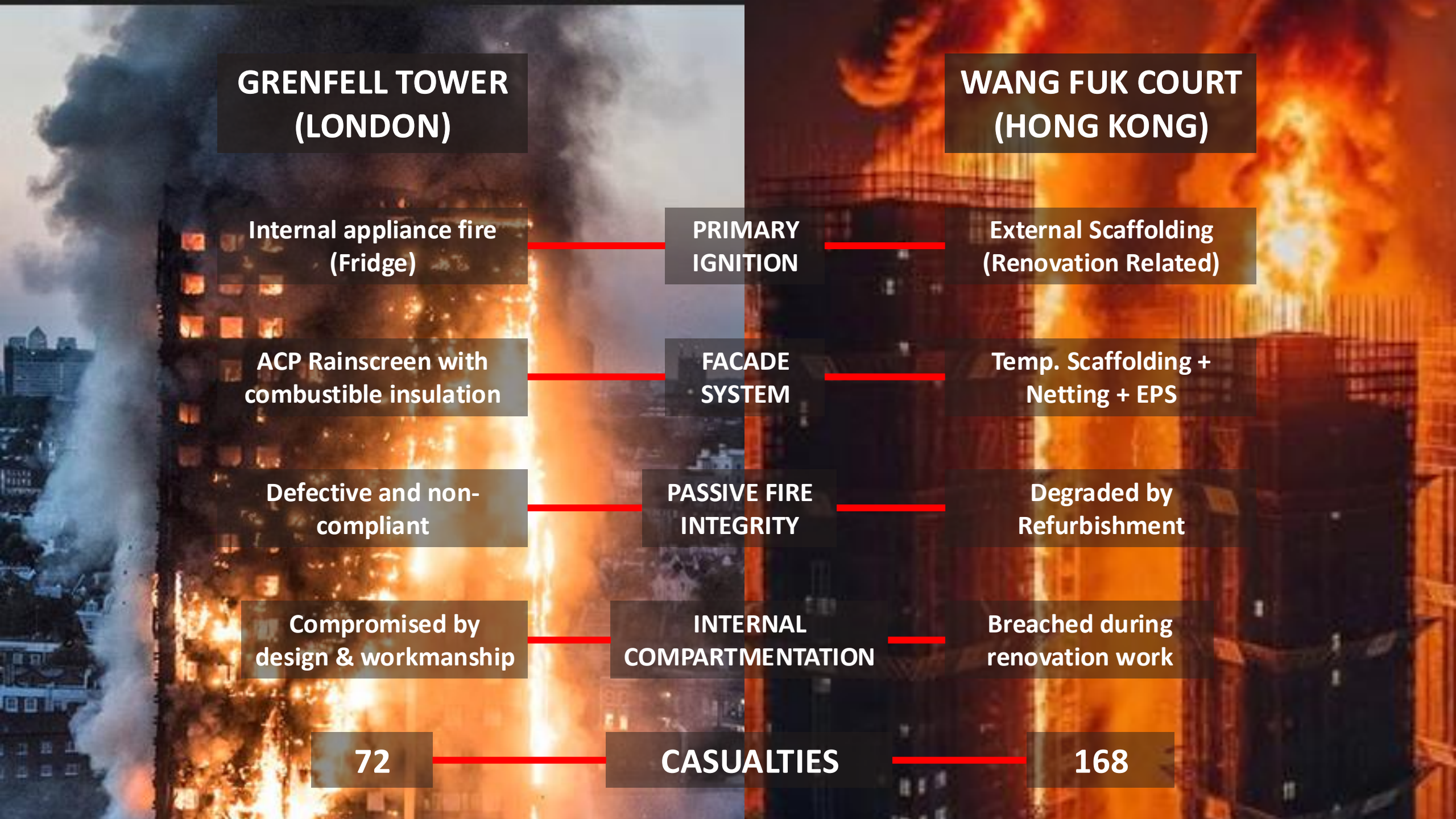


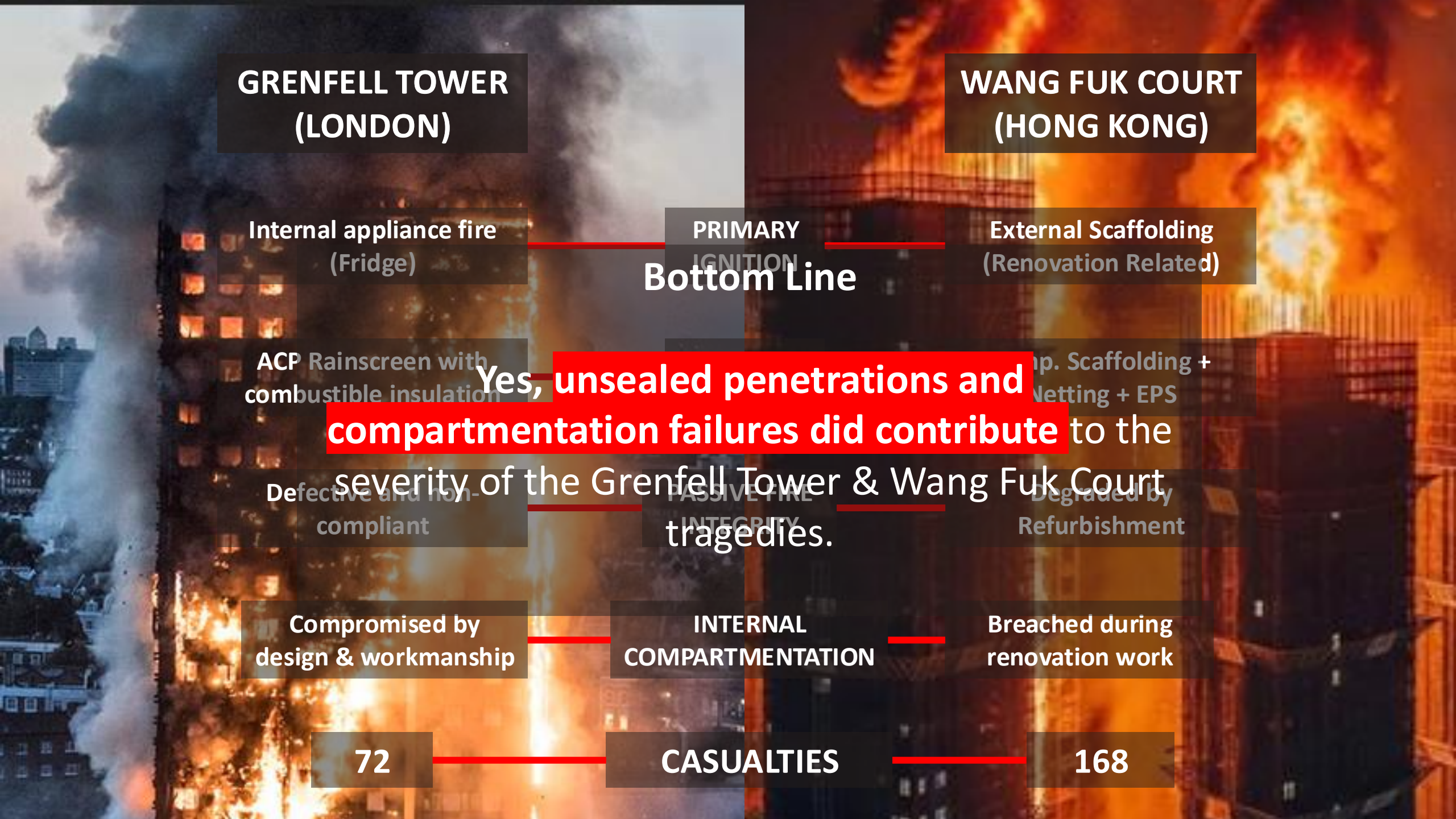
Façade Cavity & Edge-of-Slab Failures

- Continuous bamboo scaffolding and netting created a **chimney effect**, but investigators also noted **insufficient cavity barriers and edge-of-slab fire seals** once façade elements were temporarily dismantled.
- This allowed **fire to leap vertically floor-to-floor**, bypassing slab-to-slab fire separation intended to arrest vertical spread

Fire Doors & Smoke Control

- Fire services confirmed that **some fire doors had degraded seals or failed to self-close.**
- Combined with failed alarms, this contributed to **smoke-logging of common areas, trapping residents.**


GRENFELL TOWER (LONDON)
WANG FUK COURT (HONG KONG)
Internal appliance fire (Fridge)
PRIMARY IGNITION
External Scaffolding (Renovation Related)
ACP Rainscreen with combustible insulation
FACADE SYSTEM
Temp. Scaffolding + Netting + EPS
Defective and non-compliant
PASSIVE FIRE INTEGRITY
Degraded by Refurbishment
Compromised by design & workmanship
INTERNAL COMPARTMENTATION
Breached during renovation work
72
CASUALTIES
168



GRENFELL TOWER (LONDON)		WANG FUK COURT (HONG KONG)
Internal appliance fire (Fridge)	PRIMARY IGNITION	External Scaffolding (Renovation Related)
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72	CASUALTIES	168

Bottom Line

Yes, unsealed penetrations and compartmentation failures did contribute to the severity of the Grenfell Tower & Wang Fuk Court tragedies.

GRENFELL TOWER (LONDON)

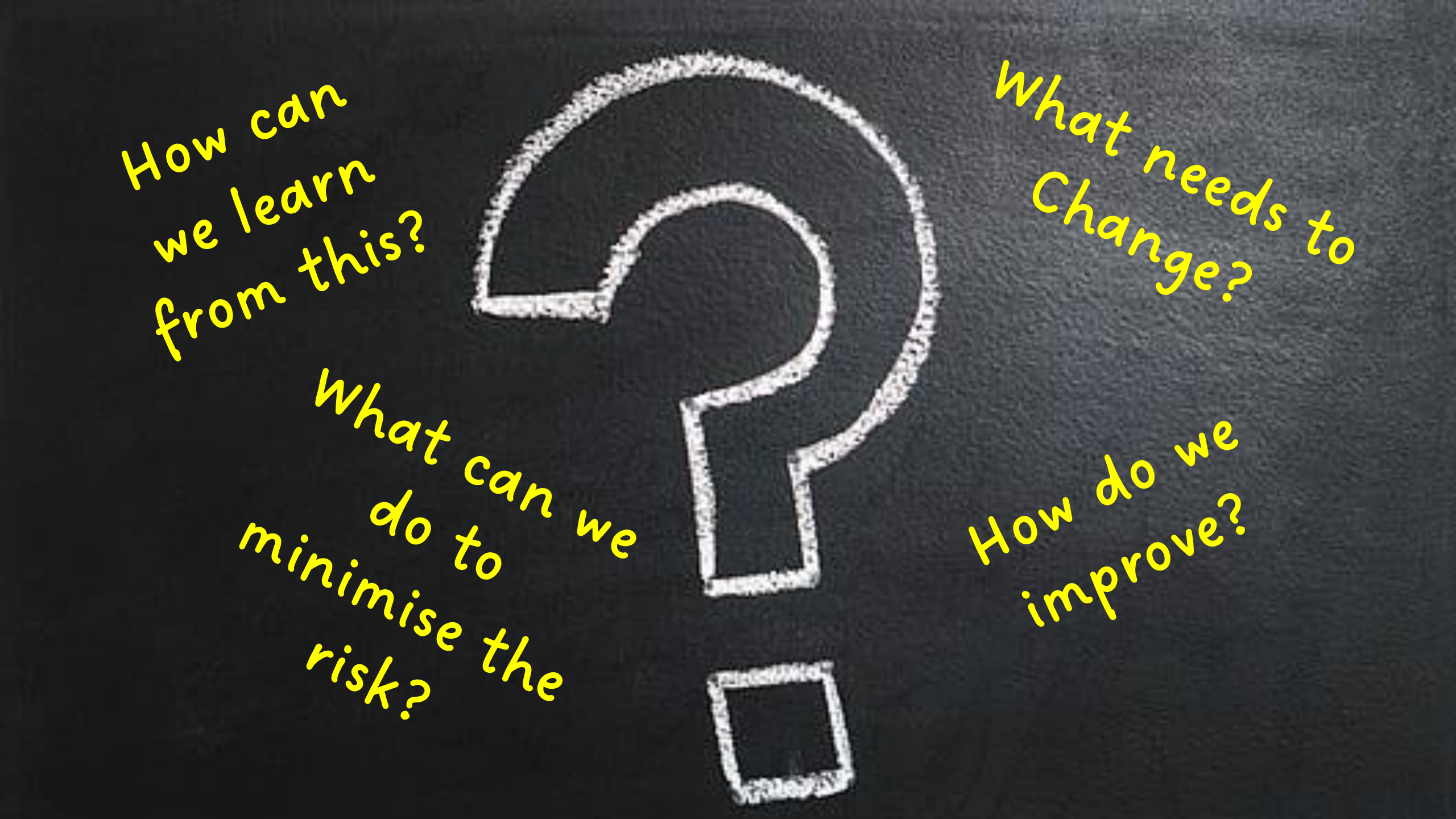
Grenfell suffered **multiple, permanent passive-fire failures**, compounded by **non-compliant façade design**

Grenfell shows what happens when **passive fire protection is wrong at conception.**

WANG FUK COURT (HONG KONG)

The buildings were not inherently non-compliant, but **façade renovation works destroyed the continuity of passive fire barriers**.

Hong Kong shows what happens when **passive fire protection is removed during construction.**


How can we learn from this?
What needs to Change?
What can we do to minimise the risk?
How do we improve?

Improving the passive fire protection (PFP) industry in Australia requires more than better products—
it needs **systemic reform** across regulation, design, installation, inspection, and ongoing building management.
Recent fires (Grenfell & Hong Kong tower fires) show that passive fire failures are rarely about materials alone, but about governance gaps.

1) Lift Standard of Evidence

Current problem

- NCC compliance is too often satisfied by **generic reports** or marketing-driven "assessed to comply" statements.
- Evidence is **frequently out of context** (wrong substrate, penetration size, service type, or orientation).

Improvement

- NCC evidence of suitability should require **exact penetration/service configuration, substrate type and thickness, and installed orientation (walls/floors)**

Outcome: Fewer "paper compliant, physically non-compliant" buildings.

2) Professional Installation & Inspection

Current problem

- Passive fire work is treated as **low-skill trade finishing**.
- Inspectors often **lack product-specific and systems knowledge.**
- **No licensing** or national competency standard.

Improvement

- **Tiered national licensing system** for installers, supervisors, inspectors.
- **Mandatory product specific training**, trained by manufacturers

Outcome: Installed systems match tested systems—in real life.

3) Improve Design Quality Early

Current problem

- Fire and services **are coordinated late**.
- Fire compartments are **violated during construction** with no redesign.
- Passive fire left to **“make it work on site”.**

Improvement

- Passive fire professionals to be **engaged at design stage**
- Designers **nominate systems, not just outcomes**

E.g. e.g.
❌ “Fire seal all penetrations to FRL”
✅ “Tested system X for bundles up to Y diameter in concrete wall”

Outcome: Site teams install what was actually intended minimising risk of non-compliance

4) Reposition Passive Fire as Life Safety Infrastructure

Current problem

- Passive fire is an **afterthought**
- **No emphasis on the importance** of passive fire

Improvement

- **Cultural reset** needed
- Passive fire should be viewed as **equivalent to structure, wet and dry fire**
- Passive fire should be viewed as **a system not just a product**

Outcome: Safer Buildings

Our Dedication

Tested and Proven Solutions

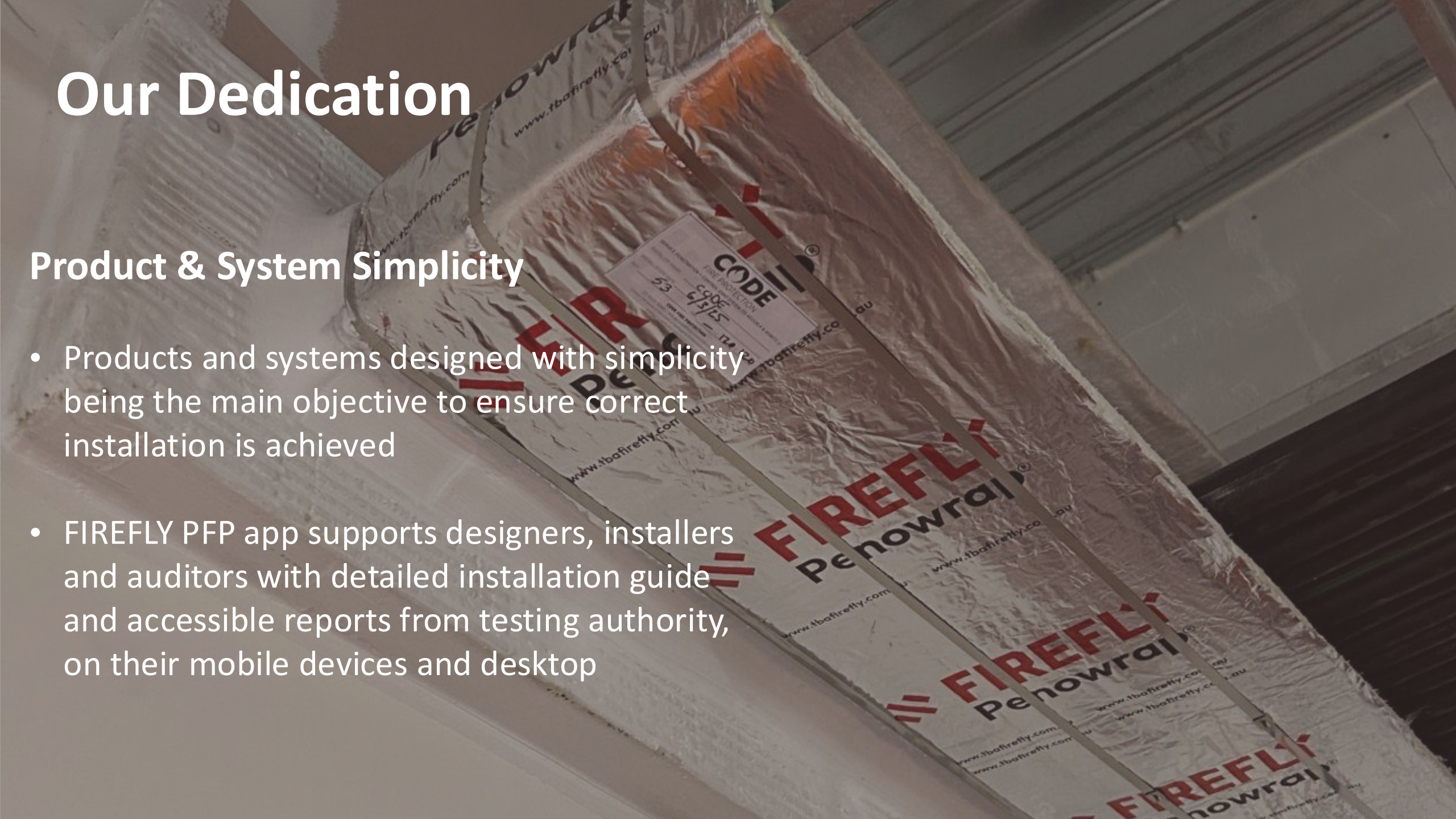
- $1.5m per year in fire testing with over 84k solutions for service penetrations
- Range includes Bushfire systems, façade systems, fire rated movement joints and structural fire protection

Our Dedication

Product & System Simplicity

- Products and systems designed with simplicity being the main objective to ensure correct installation is achieved

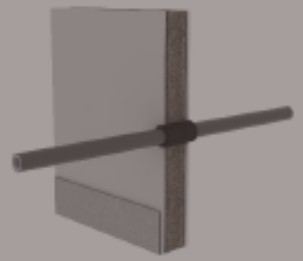
- FIREFLY PFP app supports designers, installers and auditors with detailed installation guide and accessible reports from testing authority, on their mobile devices and desktop



Our Dedication

Detailed and easy to read reports

- Substantial investment in time and money spent to ensure our reports are clear and concise for designers, installers and inspectors

Item	Service Description	Installation concept	Penetration seal description	Support Construction	FRL
V88A	Ardent pair coil bundle consisting of up to: • 1 of, max. 15.8 mm OD (nom.) copper with max. 6.3 mm thick CLPE foam insulation and max. 9.6 mm OD (nom.) copper with max. 6.7 mm thick CLPE foam insulation + • 2 of, max. 2.5 mm² core TPS cables, or other cables, with total equivalent cross-sectional copper conductor area + 18 mm condensate drain hose.		1. Core hole of up to nom. 70 mm diameter. 2. Annular gap - min. 10 mm, max. 30 mm. 3. Apply FIREFLY HP in the annular gap, to the full depth of the wall.	60 mm thick Brickworks Pronto panel wall system, or equivalent. Capable of min. FRL of -/60/60 (Item 7)	-/60/60
V88B	Pair coil bundle consisting of up to: • 1 of, max. 9.4 mm OD (nom.) copper with max. 10 mm thick nitrile rubber insulation and max. 6.45 mm OD (nom.) copper with max. 12.2 mm thick nitrile rubber insulation + • 1 of, max. 2.5 mm² core TPS cables, or other cables, with total equivalent cross-sectional copper conductor area + • 18 mm condensate drain hose.		1. Core hole of up to nom. 70 mm diameter. 2. Annular gap - min. 10 mm, max. 30 mm. 3. Apply FIREFLY HP in the annular gap, to the full depth of the wall.	60 mm thick Brickworks Pronto panel wall system, or equivalent. Capable of min. FRL of -/60/60 (Item 7)	-/60/60
V89	Up to DN25 PEX-AL gas pipe (or nom. 25.9 mm OD and max. wall thickness of 3.1 mm).		1. Annular gap - min. 10 mm, max. 30 mm. 2. Apply FIREFLY HP in the annular gap, to the full depth of the wall. 3. Apply a 10 mm fillet of FIREFLY HP around the service, on each side of the wall.	60 mm thick Brickworks Pronto panel wall system, or equivalent. Capable of min. FRL of -/60/60 (Item 7)	-/60/60
V90	Up to DN40 PEX pipe (or nom. 40 mm OD and max. wall thickness of 6 mm).		1. Annular gap - min. 10 mm, max. 30 mm. 2. Apply FIREFLY HP in the annular gap, to the full depth of the wall.	60 mm thick Brickworks Pronto panel wall system, or equivalent. Capable of min. FRL of -/60/60 (Item 7)	-/60/60

Our Dedication

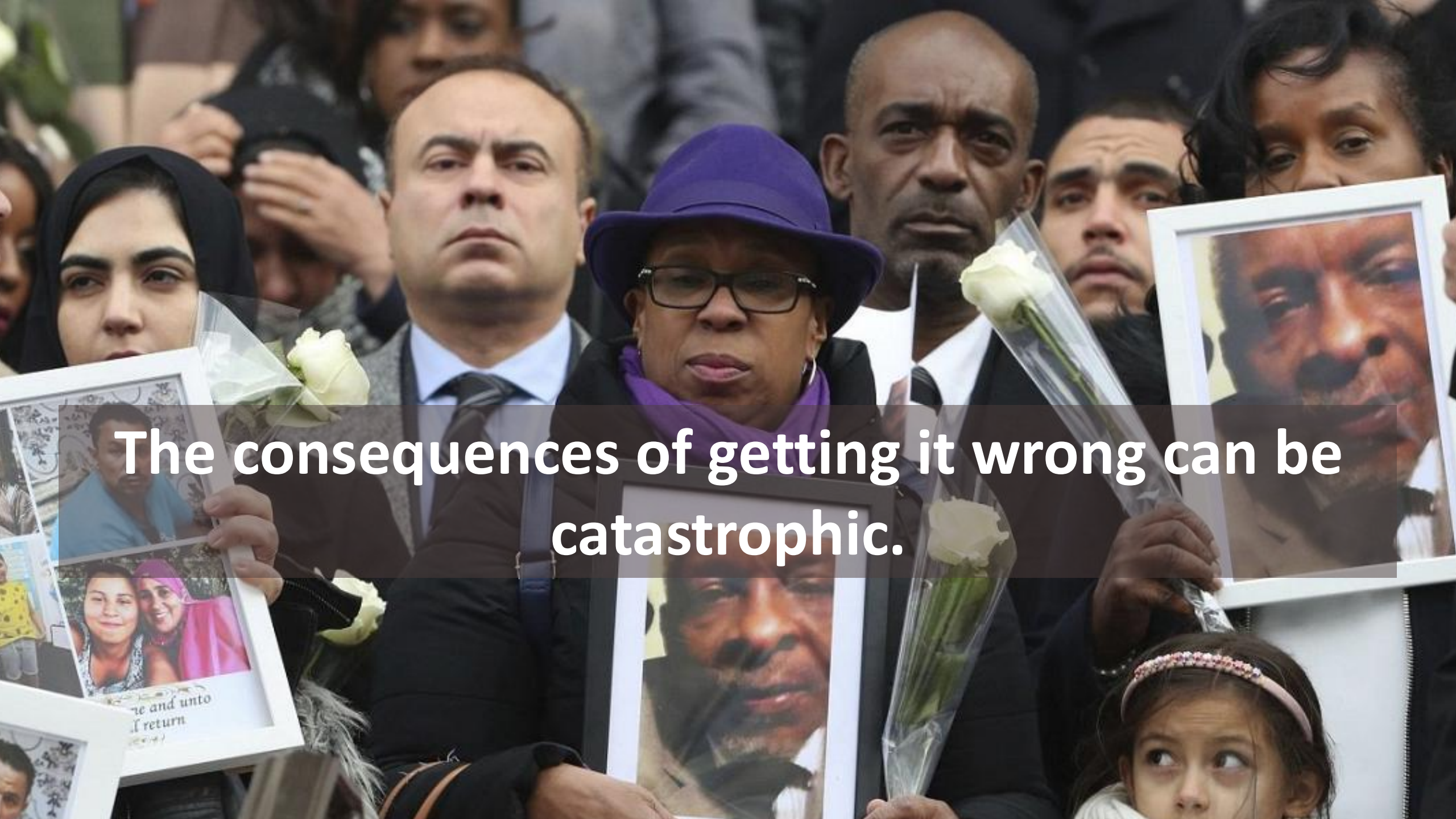
Product Labelling

- Our product labelling do not include the FRL, instead it references the relevant reports.

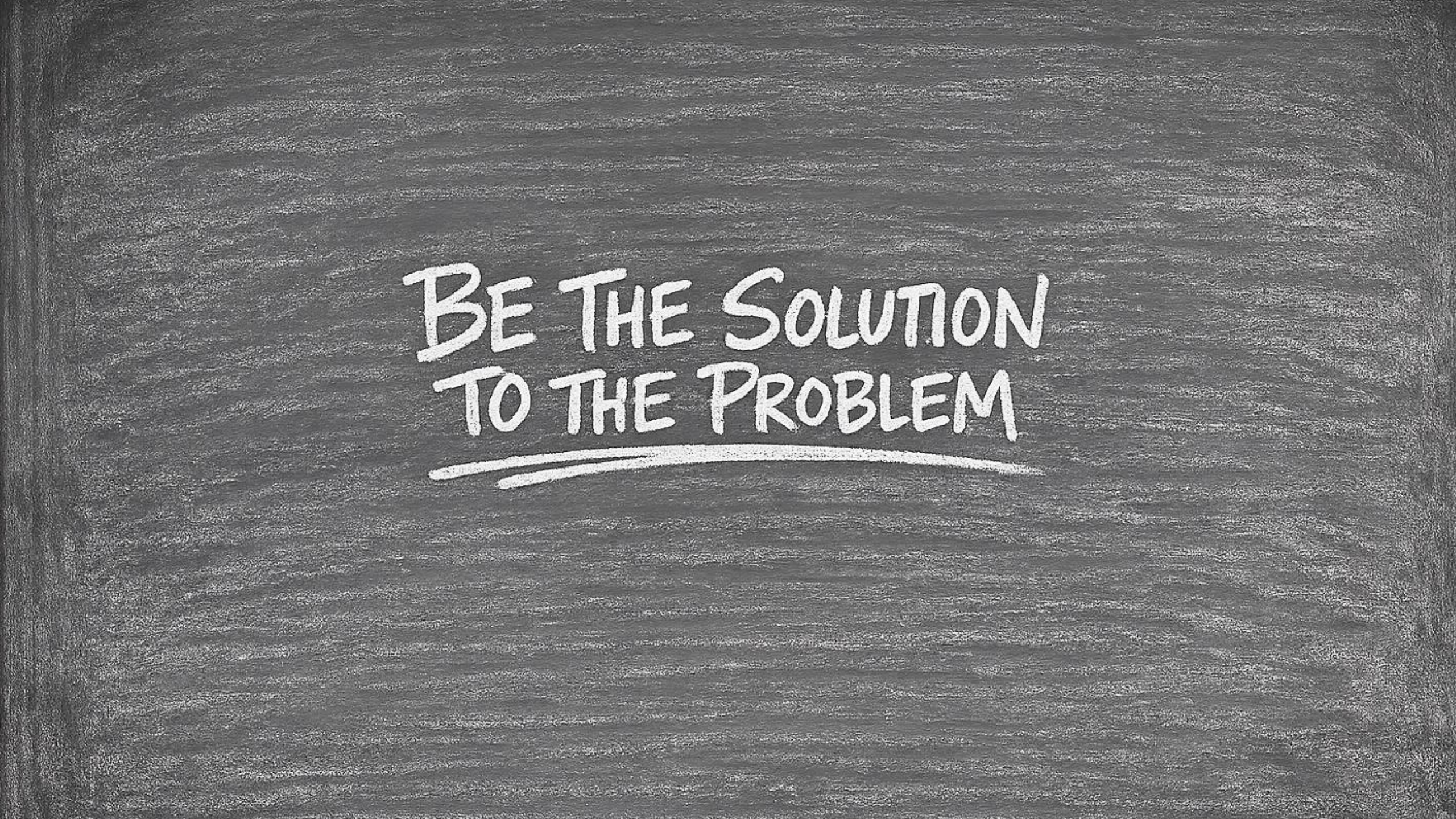
Our Dedication

Education

- Heavily focused on training designers, installers and inspectors on our products and systems.



The consequences of getting it wrong can be catastrophic.


BE THE SOLUTION
TO THE PROBLEM


Be the solution to the problem.