

MAXIMISING CODE COMPLIANCE TO MINIMIZE DISPUTES

- INTEGRATING FIRE SAFETY
ENGINEERING INTO DESIGN AND
CONSTRUCTION

8 April 2019

HK>A

FIRE ENGINEERING

Maximising Code Compliance

- Code Compliance includes:
- Performance Based Design and Alternative Solutions

FIRE ENGINEERING

Maximising Code Compliance

Integrating Fire Safety Engineering Into Design And Construction

- Role of the Fire Engineer
- Typical Disputes
- Communication
- The CRUX Report

AL BROWN



- Eur Ing & Chartered Engineer (Fire & Mechanical)
- MIMechE MIFireE PMSFPE MIFSM
- NFPA 318 and 75 Technical Committee Member

HKA (2018 -)

- Expert Witness: Fire Sector- Lead
- Testifying Expert

RUSHBROOK (1999-2018)

- Fire Safety Consultancy
- Industrial Fire Risk

FM Global (1985-1999)

- Fire Risk Engineer
- Corporate Semiconductor Specialist

ABOUT HKA

HKA is the world's most experienced construction **claims consultancy and dispute resolution firm.**

Our global portfolio includes some of the world's largest and most prestigious projects across a wide range of market sectors that include **buildings, industrial, infrastructure, oil and gas, power and utilities, and technology.**

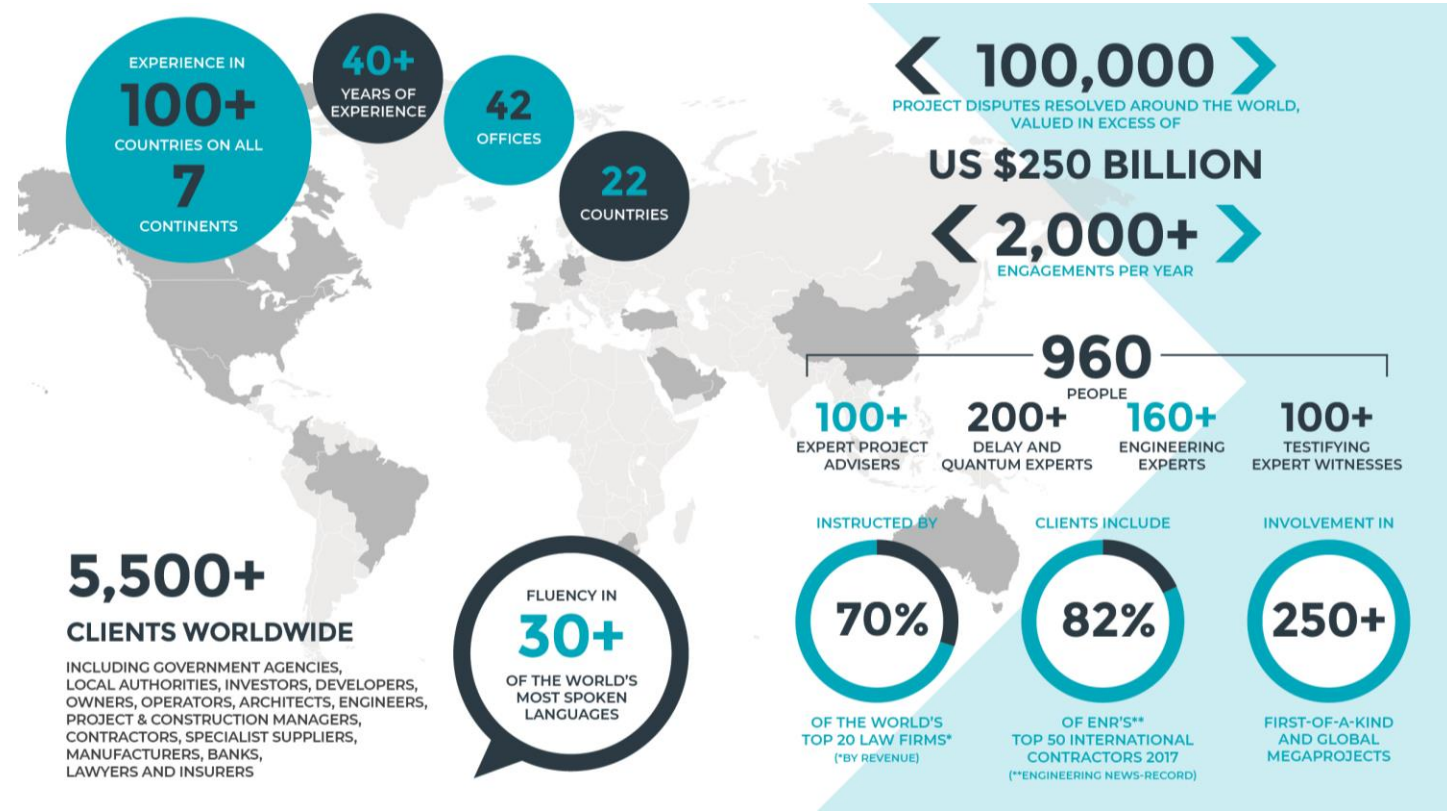
We occupy the unique, multi-disciplinary space that combines **forensic technical, delay and disruption, and financial quantum analysis.**



EXPERTS - QED+

- Quantum
- Engineering
- Delay
- +

- + Forensic Accounting



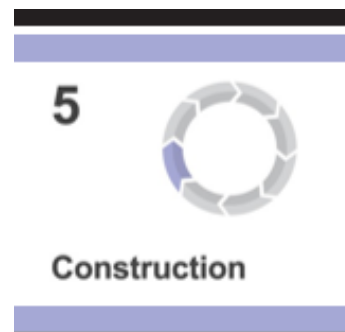
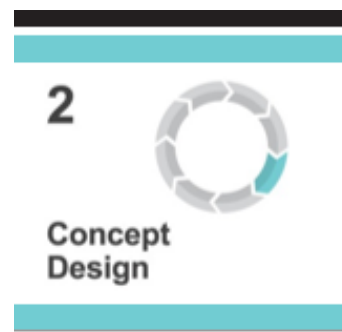
FIRE ENGINEERING

Grenfell Tower, London - 14 June 2017

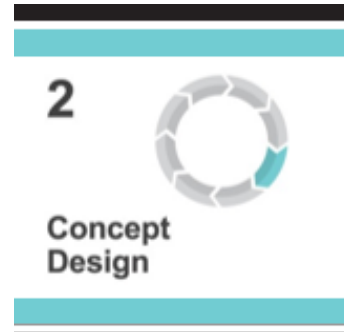
- 72 fatalities
- Public enquiry underway
- In England: 470 high-rise residential buildings and publicly owned buildings with Aluminium Composite Material (ACM) cladding systems
- Led to changes made to Building Regulations (England) in November 2018
- Numerous disputes involving building owners, contractors, architects and fire engineers



FIRE ENGINEER PARTICIPATION - RIBA PROJECT ROLES



FIRE ENGINEER PARTICIPATION - RIBA PROJECT ROLES



FIRE ENGINEER PARTICIPATION - RIBA PROJECT ROLES



FIRE ENGINEERING

Fire Engineer Involvement

- If not throughout the project, then.....

how is a fire strategy implemented and verified?

Strategy - “A plan of action designed to achieve a long-term or overall aim”

Fire Strategy

- A plan of action?
- *RIBA - “A living document which responds not only to the Project Brief, but to on-going changes in the design and selection of materials”.*

WHAT IS A FIRE ENGINEER?

- Fire Detection Design Engineer
- Sprinkler Design Engineer
- Fire Protection Engineer
- Fire Safety Engineer
- Fire Risk Engineer
- Professional Fire Engineer
- Chartered Fire Engineer



WHAT IS A FIRE ENGINEER?

What is their scope of work?

- Sprinkler Design?
- Fire Alarm Design?
- Fire Safety Design/Consulting?
- Fire Protection?
- Materials Selection/Consulting?
- Code Compliance?
- Insurance/Risk Management?



IDEAL FIRE ENGINEER INVOLVEMENT

1. **Develop Fire Strategy** in association with stakeholders
2. **Participate** in transfer of fire strategy into models or drawn information
3. **Monitor and review changes** to design and selection of materials during design and construction
4. **Verify Installation** of all aspects of the fire strategy, including:
 - a) Materials
 - b) Fire Protection – Active
 - c) Fire Protection – Passive
5. **Provide Information** to owner/occupier to enable effective management of fire risk after construction

TYPICAL FIRE RELATED DISPUTES

Fire Protection – Active

- Specification – lacking detail, not related to the fire hazard, resulting in under or over-protection
- Detail design and installation, including incorrect setting out leading to obstructed sprinklers or excessive spacing of sprinklers

Fire Protection – Passive

- Incorrect or missing fire stopping of penetrations
- Firestopping installed outside its fire test certification parameters

Cladding Systems

- ACM, insulated render systems



ACM AND CLADDING DISPUTES

Did the installation meet the “Requirements” of the Building Regulations?

Did the design follow building regulations guidance, (Approved Document B (“ADB”)?)

Did designers understand the guidance?

Were fire test classifications understood?

- Applicability of small scale tests (BS 476-6 and BS 476-7)

- Parallel system of European Classification

- Full scale testing (BS 8414 & BR 135 Performance classification)

What was the role of the Fire Engineer?

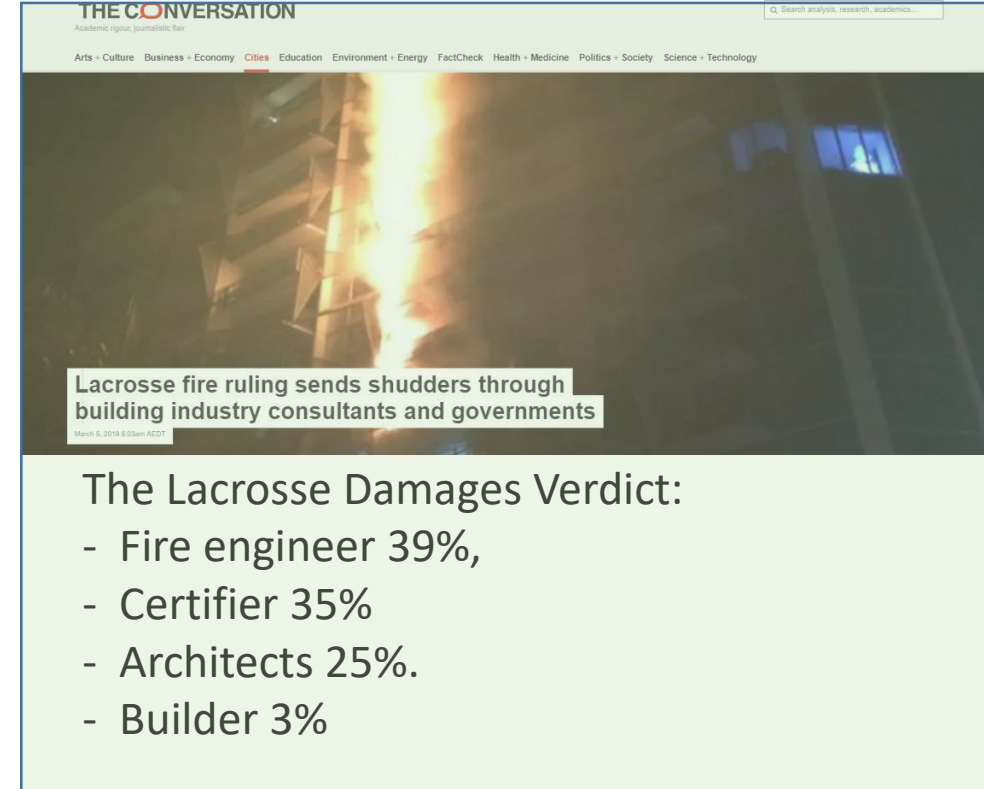
FIRE ENGINEERING

Sitting on the Fence is no longer an option

Fire engineers need to manage the risk of litigation and dispute by fulfilling their professional and contractual obligations.

Will the fire engineers' report or involvement in a project:

- prevent another fire such as Grenfell, Lacrosse or the Torch, or
- simply allow building code approval for a project



The screenshot shows a news article from 'THE CONVERSATION' with the headline 'Lacrosse fire ruling sends shudders through building industry consultants and governments'. The article is dated March 6, 2019, at 8:03am AEST. Below the headline, a list titled 'The Lacrosse Damages Verdict:' shows the following distribution of blame: Fire engineer 39%, Certifier 35%, Architects 25%, and Builder 3%.

THE CONVERSATION
Academic rigour, journalistic flair

Arts + Culture Business + Economy **Cities** Education Environment + Energy FactCheck Health + Medicine Politics + Society Science + Technology

Q. Search analysis, research, academics...

Lacrosse fire ruling sends shudders through building industry consultants and governments
March 6, 2019, 8:03am AEST

The Lacrosse Damages Verdict:

- Fire engineer 39%,
- Certifier 35%
- Architects 25%.
- Builder 3%

FIRE ENGINEERING

Prevention

- Professional and industry bodies are working on guidance to better integrate fire safety engineering advice into construction projects
- Professional fire engineers need to take on the additional responsibility, but.....
 - Aversion to Risk
 - Professional Indemnity Insurance Limitations
 - Training and Experience



STATEMENT OF ETHICAL PRINCIPLES

Engineering professionals have a duty to:

- uphold the highest standards of professional conduct including **openness**, fairness, honesty and **integrity**;
- obey all applicable laws and regulations and **give due weight** to facts, published standards and guidance and **the wider public interest**;
- acquire and **use wisely** the understanding, knowledge and skills needed to perform their role;
- abide by and **promote high standards of leadership and communication**;

<https://www.engc.org.uk/standards-guidance/guidance/statement-of-ethical-principles/>

FIRE STRATEGY REPORTS

“These strategies are using prepared in outline at Stage 2 and in Detail at Stage 3, with the recommendations absorbed into the Stage 4 outputs and Information Exchanges”

“The intention is that they should be transferred into the various models or drawn information”

Who is responsible for ensuring that this happens in accordance with the intent of the strategy?

? | Project Strategies

The strategies developed in parallel with the Concept Design to support the design and, in certain instances, to respond to the Final Project Brief as it is concluded. These strategies typically include:

- Acoustic Strategy
- Fire Engineering Strategy
- Maintenance and Operational Strategy
- Sustainability Strategy
- Building Control Strategy
- Technology Strategy.

These strategies are usually prepared in outline at Stage 2 and in detail at Stage 3, with the recommendations absorbed into the Stage 4 outputs and Information Exchanges.

The strategies are not typically used for construction purposes because they may contain recommendations or information that contradict the drawn information. The intention is that they should be transferred into the various models or drawn information



257

COMMISSIONS RESEARCHED

3043

CAUSES IDENTIFIED

7

PRIMARY CAUSES IDENTIFIED

400⁺

US\$ BILLION OF
CAPITAL EXPENDITURE

13

UNDERLYING CAUSES, ON
AVERAGE, PER DISPUTE

6

SECONDARY CAUSES IDENTIFIED

39

MAXIMUM NO. OF CAUSES
ON A SINGLE PROJECT



TOP TEN CAUSES OF DISPUTES



1. **SLOW PROGRESS**
2. VARIATIONS
3. **EXTENSIONS OF TIME**
4. **LATE AVAILABILITY OF INFORMATION/DESIGN**
5. CHANGE OF SCOPE
6. **MANAGING – TIME**
7. DIFFERENT INTERPRETATIONS OF THE CONTRACT PROVISIONS
8. **ADVERSARIAL CULTURE**
9. **DESIGN ERRORS/BUILDABILITY**
10. **LACK OF COMMUNICATION**

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DISPUTE AVOIDANCE FOR BUILDING SERVICES

Know Your Duties

- Define your Scope
- Monitor and record change
- Manage your client's expectations
- Site Supervision Duties
- Agree, read, and make sure your team read, your contract!

DISPUTE AVOIDANCE FOR BUILDING SERVICES

Diligence

- Follow your procedures and keep records
- Disputes are generally follow breaches of contract – **know** and follow the requirements of **your contract**.

DISPUTE AVOIDANCE FOR BUILDING SERVICES

Keep Records

- RECORDS, RECORDS, RECORDS!!
- If the expert can't find records to KNOW what happened then we need to ASSUME and interpret facts based on our experience. “