

Total Fire Engineering

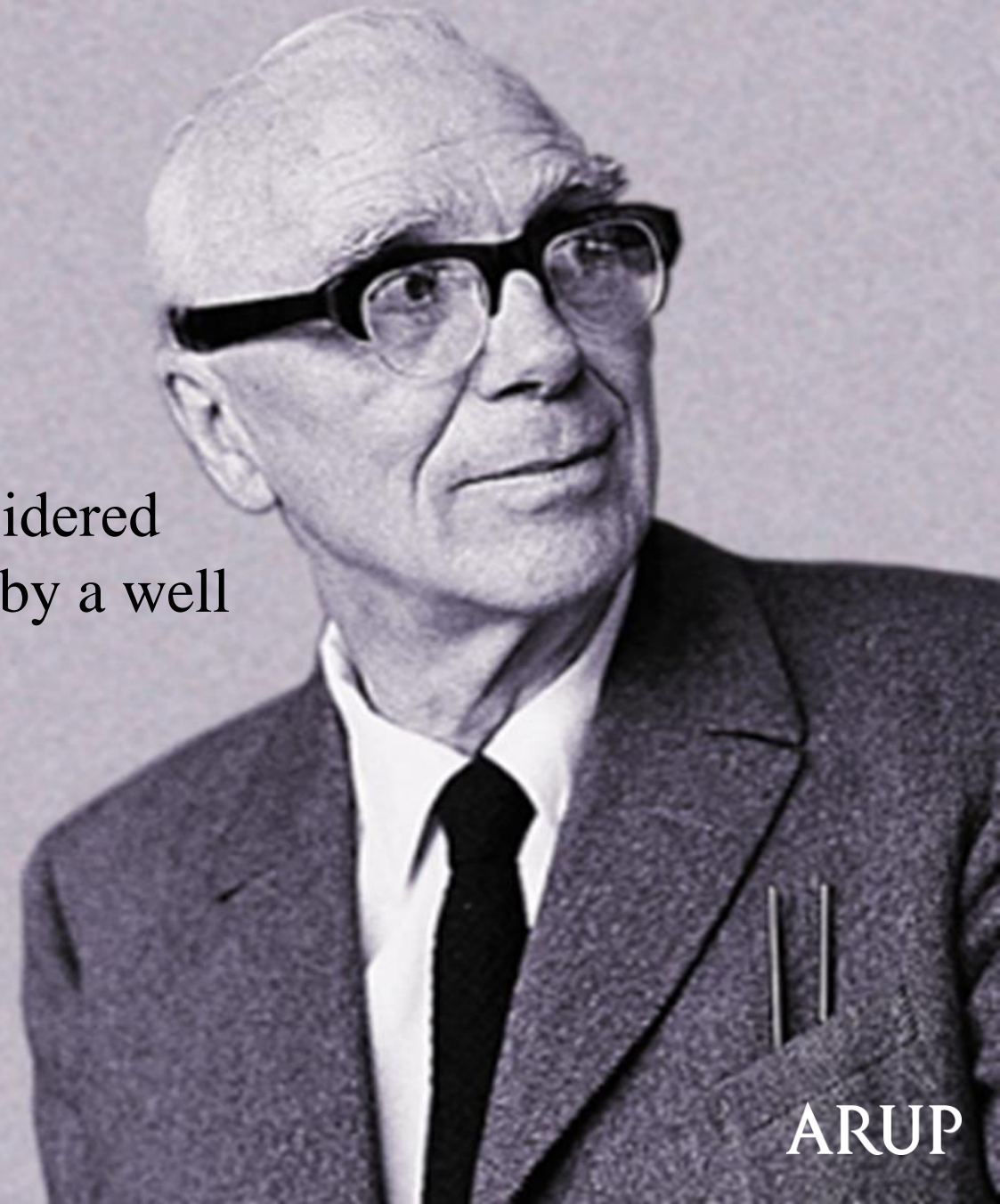
27th November 2019



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Ove Arup and Total Architecture

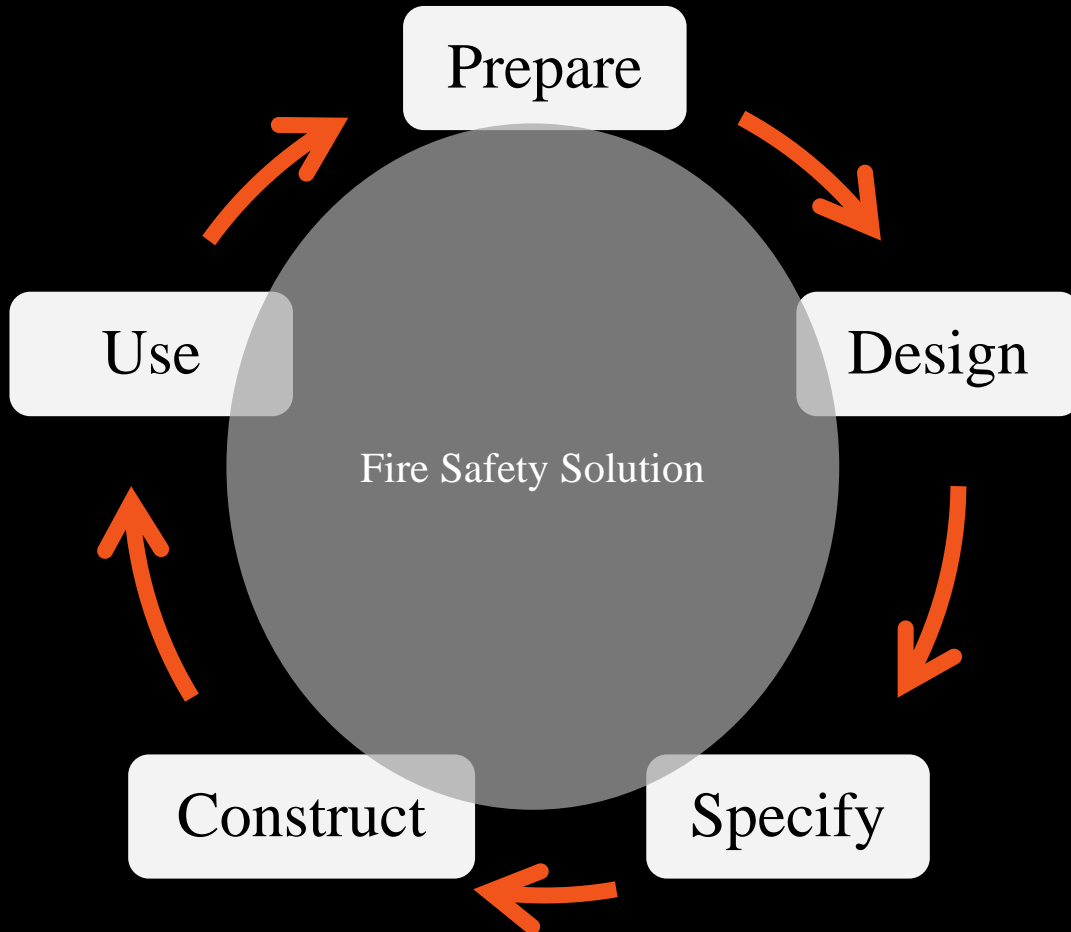
‘...all relevant design decisions have been considered together and have been integrated into a whole by a well organised team.’



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So what is ‘Total Fire Engineering’ that we in Arup
have been talking about?

Total Fire Engineering



‘...all relevant **fire safety design**, **construction** and **operation** decisions have been considered together and have been integrated into a whole by a well organised team.’

The Fire Engineer needs to ask the right questions.

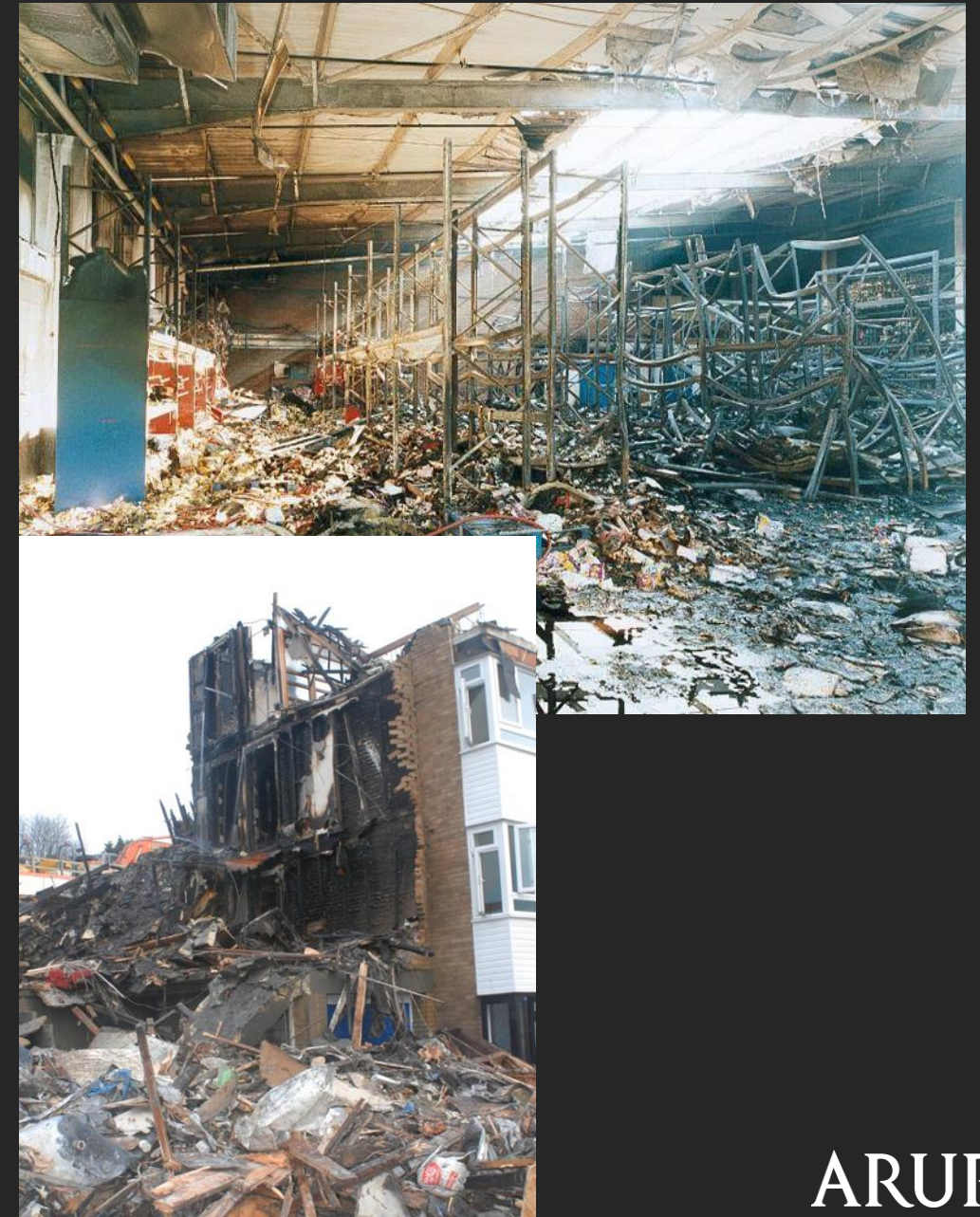
The process...

Need to establish
Goals, Constraints
to arrive at the
correct solution and
test the design
against these.



Establishing Goals

These need to consider beyond life safety



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Goals beyond life safety

Goal	Social	Economic	Environmental
People	Life safety		
Quality of Asset	Quality of space	Cost and value of asset	Construction impact
Quality of Operation	Functionality of space	Operational costs	Operational impact
Protection of Asset	Environmental continuity of asset	Property Protection	Prevention of fire damage to the environment
Protection of Operation	Continuity of function	Business Continuity	

$$\text{Total Cost} = \text{Cost of Prevention} + \text{Cost of Protection} + \text{Cost of Occurrence}$$

Considers:

Social

Economic

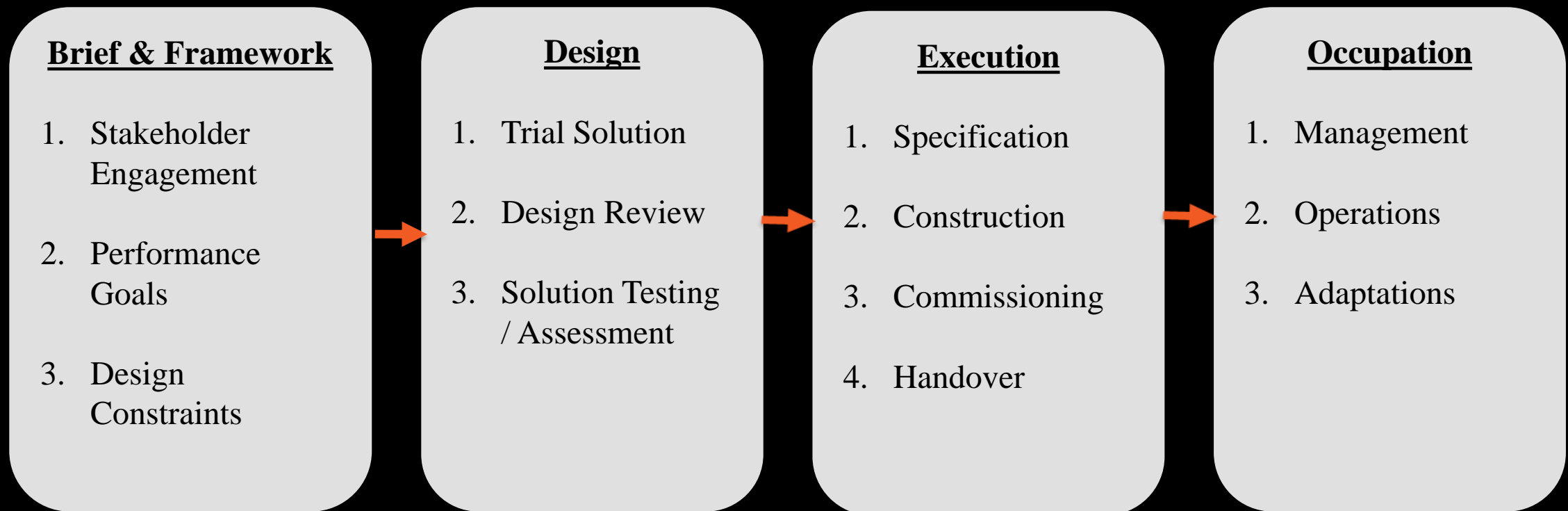
Environmental

Constraints

The constraints are the aspects of the project within which the fire strategy has to work

Category	Examples
Building Constraints	Geographic, site and jurisdictional location
	Construction type and materials, planning constraints
	Site boundaries and adjacencies
Occupancy Profile	Number of occupants
	Behavioural characteristics / Impairments
Fire Hazards	Fire load (amount, material and location)
	Growth rate, smoke yield, etc.
Operational Constraints	Management (number of staff), activity completion
	Assisted evacuation strategies, training ability
Resource	Financial
	Programme
	Material and system availability

Implementing Total Fire Engineering



The Fire Engineer provides continuity - if appointed through all stages

Our aims;

- Design ‘knowingly’
- Be competent in: Design, Specification, Construction and Handover and occupation
- Understand codes and standards
- Accept we are still learning
- Be appointed on value not cost
- Lead the construction industry
- Challenge when required
- Shoulder appropriate responsibility





Total Fire Engineering =
Good design, specification, construction & handover and end user
occupation

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Thank you for participating

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