## grenfell tower fire: the importance of ethics and professionalism for the procurement of safe buildings and infrastructure in the construction industry.

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### abstract

The Grenfell Tower fire resulted in the loss of 72 people. A series of events led to the tragedy that our construction industry must scrutinise beyond the public inquiry which is still underway. The tower had recently undergone a ‘revamp’ with the addition of a new cladding system which seems to have allowed the fire to spread with catastrophic consequences. A series of questions have been raised regarding the choice of materials, the detailing, the certification, the policies and regulations within the industry. The complex nature of the construction process and the crossover between the disciplines makes it difficult to allocate direct professional liability but what lessons can be learnt in terms of professional development and ethics for such an event to be avoided in the future?

The de-centralisation and privatisation of key aspects of control and supervision of safety in buildings has been imminent in the neo-liberal policy of both Labour and Conservative governments in the past 30 years.

In addition, the general “self-regulatory” approach that the Construction industry has taken must be questioned. This tragedy must be viewed as threshold of “the before and after” of a chapter and the serious study of the public interest versus profitable enterprise.

Keywords: quality, procurement, safety, ethics, privatisation.

### INTRODUCTIOn

The purpose of this research is to examine the ethical consequences exposed by the Grenfell Tower Fire by using the procurement and construction standards of the tower re-cladding exercise, that took place in 2015, as a case study to highlight the importance of ethics for the procurement of safe buildings and infrastructure in the construction industry. Namely the topics of research are:

1. **Ethics, Profit Margins & Minimal Requirements in Construction**

The industry has an ethical obligation to ensure that safety and quality in construction is not compromised in the name of profit. Developers must not be encouraged by governments to be happy with the absolute minimum.

1. **Ethics & Privatisation of Bodies within the Construction Industry**

The impact of the privatisation of Building Regulations and Material Certification/Testing Bodies which follows the dynamics imposed by neo-liberalism means that the control of economic factors have been switched from the public sector to the private sector.

### research aims & methodology

The purpose of this section is to clarify the methodological framework used to conduct this research. The aim of the research is to use the Grenfell Tower fire as a case study to examine the ethical issues that arise from a tragedy of this scale that could have been avoided.

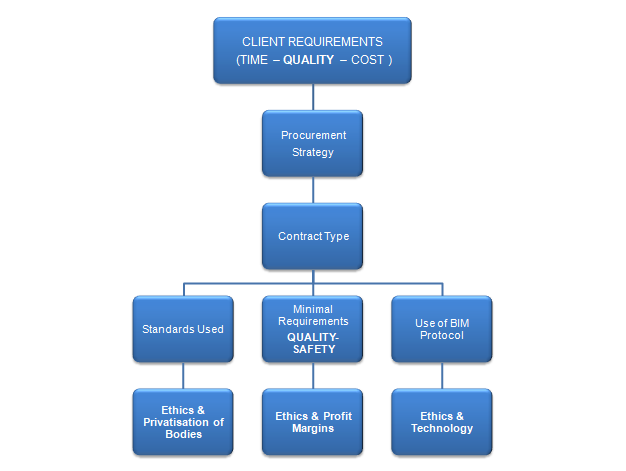
The questions that this research will attempt to examine is what went wrong with the very precise UK procurement procedure.

* Do the current state of building regulations, the testing of standards, the use of a Design and Build contract, and government decisions and policies have an impact on the quality of social housing construction and is the appropriate duty of care used to do so?
* How could have a £8.7m pound public sector refurbishment be more unsafe and unfit for purpose?
* Do any of the above imply unethical construction practices in the name of profit?

This methodology approach will examine on the one hand procurement looking at how the procurement process (see figure 1) leads to the selection of contract, how the contract distributes risk and liability as well as implies the use of building standards, how systems should be tested and certified to guarantee quality and safety. Professional consultants and contractors are expected to behave with integrity and reasonable care, the liability in terms of quality will depend on the procurement method. The Grenfell Tower procurement process will be scrutinised. On the other hand it is key to also examine the UK government decisions and policies on housing and building regulations and look at how privatisation of certifying bodies may have had an impact on the unfit for purpose delivery of the project.

Once this process is applied to the Grenfell tower renovation works, the ethical consequences and conclusions can be analysed and technological suggestions will be presented that could potentially help to prevent another tragedy occurring.

Figure 1

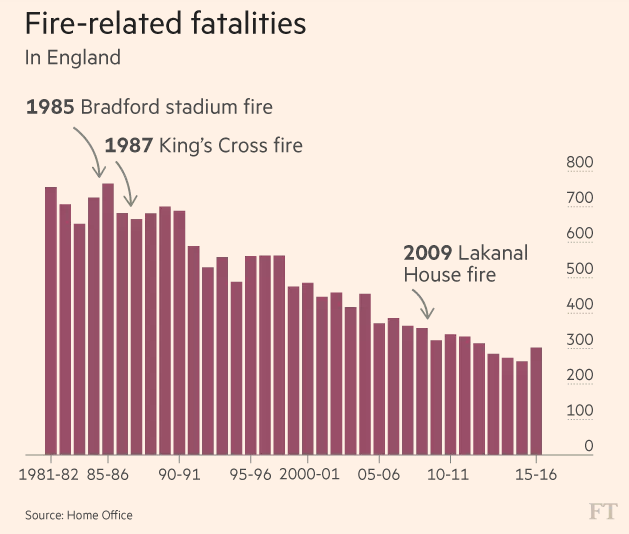


### background

According to Arnold Tarling (member of the Association of Specialist Fire Protection & chartered surveyor), if the Grenfell cladding renovation had not taken place, the fire would not have spread so quickly. Experts have reasons to believe that the fire would been contained within the designated fire compartments, which the existing concrete framed and enveloped design, that met building regulations at the time of construction of the original building design had allowed for. Concrete as a material rates highly in terms of fire resistance whilst the primarily aluminium cladding that was used to re-clad Grenfell tower is a highly flammable material and has high conductivity. The new rain-screen cladding system added on to the existing concrete facade of Grenfell tower would heat up and spread very quickly through windows, and then floor to floor up the exterior of the new cladding curtain wall via the air gap between the old and the new facade that acted as a chimney.

The thoroughly disheartening fact is that this is not the first fire tragedy to take place in the UK (see graph 1). Tarling, a leading fire safety expert, warned Government advisors three years before the Grenfell tragedy that an inferno would happen unless they changed rules to ban cheap, flammable insulation used on the outside of buildings. In addition, the Grenfell Tower residents had voiced concerns only months before the fire regarding the fact that that a single staircase was their only means of escaping the building. And beyond that no sprinkler systems had been fitted within the only means of escape, not all doors were fire-proofed and according to Dr Stuart Smith, a building surveying and fire safety lecturer at Sheffield Hallam university: “The rate at which the building was burning suggests that even if the fire breaks were there, they didn’t work’’ (Dixon, 2017).

Graph 1



### procurement and contractual implications of grenfell tower

**Types of Client** – **Private v Public Sector**

Walker (1996) suggests that you can classify Clients as:

* The individual Client
* The corporate Client
* The Public Cient

For the purpose of this research we will narrow this down to two categories, namely:

* The Private client (for own use, for development/ investment)
* The Public client

Masterman (2002) suggests that one of the characteristics of privately financed projects is to maximise profit whilst one of the characteristics of publicly financed projects is that they must not aim to profit.

This in itself identifies the key difference between a private and public sector jobs and highlights that bearing in mind that the privately financed projects could be done for profit (development/investment), compromising quality of specification is common in order to maximise the profit margin. Public sector construction projects and therefore any specification, testing, quality assurance and safety issues should not be connected in any way to the private sector as there is a conflict of interest to do with profit and in retrospect quality matters and hence safety issues which in many cases, as the one of Grenfell tower, depend on quality . The cladding system which has been reported to have contributed to the vast spread of the fire was originally specified to be zinc cladding with a fire resistant core. It was later downgraded to non fire rated and cheaper aluminium panels which helped generate a £293,368 cut to the cost of the cladding.

‘’Researchers claim the panel system used for Grenfell had a calorific value equivalent to 12,000 litres of petrol, while the insulation foam added the equivalent of almost another 20,000 litres. The foam has also been shown to release cyanide gas when it burns and it is feared this may have contributed to the death toll.’’ (Jessel, 2018)

The issue of how dangerous low spec non fire rated and non tested cladding is, had been flagged to the government and other relevant statutory authorities on a number of occasions prior to the Grenfell Tower fire.

**Client Requirement – Type of Contract**

Any construction project will be procured based on the Client requirements which will depend on time, cost, quality, risk, the type and size of the project as well as the experience of the client. These requirements will determine the type of contract.

There are three main procurement routes in the construction industry.

**Traditional Procurement:** Longest in terms of time as the design and construction phases are separated, highest in terms of quality as the design team will detail the job. Cost may be higher to guarantee quality but the cost is known before construction commences.

**Design and Build Procurement** (used on Grenfell tower renovations): This is a contractor led form of procurement. The designers only commence with the concept design stage and the project is then passed on to the contractor to design and build. It is good in terms of time as design and construction phases can overlap but can compromise quality in that the contractor will provide details but to meet a pre agreed lump sum which is calculated with minimum design information (concept design = general arrangement drawings). The contractor may detail and specify lower quality materials with lower workmanship to meet the pre-agreed cost. Standard contract such as JCT Design and Build contracts do try and stipulate this by adding clauses such as: “The Contractor shall in respect of any inadequacy in such design have the like liability to the Employer… as would an architect or, as the case may be, other appropriate professional designer… who… has supplied such design for or in connection with works to be carried out and completed by a building contractor who is not the supplier of the design.” (Githunguri, 2014).

It is therefore implied within the Design and Build contract that as with the Architect, the Contractor must carry out works with reasonable skill and care and must warranty that the completed works will be fit for purpose.

**Management Procurement:** Hybrid and most recent form with characteristics of both Traditional and Design & Build procurement. Client takes on all the project risk by contracting designers, a construction manager or management contractor to act as independent advisors and then contracts each sub-contractor work package directly. This requires an experienced Client that can control the quality via the design team and the independent contractor, can overlap design and construction to speed up the process and can save money by contracting work packages directly (without main contractor hidden profit)

### Government decisions and policies affecting construction quality & fire issues

The Grenfell renovation was funded by the Royal Borough of Kensington and Chelsea via the Government that has a duty to provide affordable housing and to improve the quality of rented housing. The past 30 years a series of Government decisions and policies, under Conservative and Labour government have led to the decrease of construction Quality in social housing.

A chronological series of events are presented below that relates to specific government decisions and policies that have a direct link to the quality of procurement of the Grenfell Tower renovations:

**1667**: First system of regulations listed in the London Building Act in response to the 1666 Great Fire of London which saw most of the buildings built primarily in wood and thatch in the square mile of London burn down. Brick and stone became the prime construction material beyond this point and the new Fire Prevention Regulations included easy access to water and the beginnings of a fire hydrant system for the city.

**1986**: Prior to this point all buildings in London fell under the London Building Acts. This ensured that external walls must have at least one hour of fire resistance to prevent flames from spreading between flats or entering inside. This would provide fire men adequate time to control the fire. Margaret Thatcher’s government replaced these rules by the National Buildings Regulations and the crucial time stipulation for fire spread was scrapped. Instead, materials used on the outside of buildings now only had to meet ‘Class O’ regulations and show that they did not add to the heat or intensity of a fire.

**1999**: a fire spread quickly through eight floors of a Scottish tower block killing a disabled resident and injuring five more people. In response to the fire, Scotland revised its Building Regulations and made it mandatory for contractors to ensure that any external cladding ‘inhibited’ fire spreading. In England successive Governments have been urged to tighten English building regulations on fire safety, but no action has been taken, ignoring risks of flammable materials being fitted to the outside of buildings instead of making improvements to existing policies to minimise risk and make regulations safer.

**2010:** Official Statistics on social housing indicated that the number of government-funded houses for social rent dropped by 97%.

**2012:** The national planning policy framework gives precedence to expensive private development while discouraging social housing. This policy is often described as a developers’ charter.

**2013**: Coroner Frances Kirkham recommends a review of building regulations on fire safety with particular regard to the spread of fire over the external envelope of a building and urges local authorities to install sprinkler systems after a blaze at the Lakanal House tower block in London killed six people. The building had been refurbished using some flammable materials. No review was carried out.

**2015:** Chancellor George Osborne announces that the rent councils charge tenants would be cut by 1%. This was not received as positively as it may initially appear as the government is aware that this rent money is reinvested in social housing, and knew also that the cut would drastically reduce the money available for repairs, refits and the building of new homes. The policy was read as a deliberate attempt by the government to degrade the quality of social housing, reducing the money available to maintain council houses and thus actively participating in the decline of the social housing quality and maintenance.

**2016**: 72 Conservative MP landlords  vote against the housing bill to make “rented properties fit for human habitation” including the communities secretary, Sajid Javid, housing minister Brandon Lewis (who has also said installing fire-sprinklers could discourage house-building), fire minister Nick Hurd, and David Cameron.

### privatisation of builiding regulations, testing and certification bodies

Official guidance on building regulations is issued by the Building Research Establishment (BRE), a body that was privatised in 1997, on behalf of the government. The guidance states that any structure 18 metres high or more, must be constructed with external walls made of materials of “limited combustibility” or comply with a testing regime. The tests are carried out by the BRE but are usually commissioned by the manufacturers of the materials. This in itself is slightly problematic as it does suggest conflict of interest. It must also be added that real-life fire scenarios do not take place on the systems tested as they would for car safety for example.

The specific cladding system used on Grenfell tower has been banned in the United States in buildings taller than 12 meters for not meeting performance requirements.

Why was this cladding system used so widely on tower blocks all over England?

In Scotland, it is only local authorities that can sign off a new or refurbished building, but in England “approved inspectors” who are normally surveyors have been allowed to do the same task since 2005. According to Mr Steve Cooper, a fire engineering partner at Cundall “The level of technical knowledge of building control surveyors across the country . . . varies enormously,”. The system of fire risk assessments — to gauge day-to-day issues in buildings — was handed from local fire services in England to building owners and landlords, also in 2005.

The sector in England was partly privatised in 1985. The National House Building Council (NHBC) introduced private bodies with approved inspectors to create competition between the private and the public sectors. A heavily criticised neoliberal rhetoric for the promotion of the open market. This has proven detrimental for the public sector as the private market does not look out for the public interest but the private capital and profit.

In May 2018, following the Grenfell tragedy, Dame Judith Hackitt  DBE, FREng, FIChemE, FCGI presented an independent review of building regulations and fire safety report to the parliament. In the report it was identified that a need for the reform of building control procedures must take place, particularly regarding high-rise residential buildings (HRRBs). It concluded that “the part-privatisation of the regulatory function had created “unintended consequences” and a “difficult trade-off” between building control bodies (BCB) competing with one another for business while still ensuring rigorous certification with all the requirements of Building Regulations” (Gerrard, 2018)

**How was the Grenfell cladding system certified?**

Building regulations in the UK and specifically Approved Document B states that ‘Class 0’ is the acceptable standard for the external walls of a high-rise building.

The government-appointed an independent fire safety panel to signed off a cladding product similar to that used on Grenfell Tower as ‘Class 0’.

For the past thirty years fire safety experts have warned that the ‘Class 0’ designation was based on small-scale tests conducted in laboratory conditions and does not properly evaluate cladding in a live fire.

Notwithstanding the above a certificate was issued by Warrington Certification, a private certification body, in 2014 for a cladding systems such as the one used on Grenfell. It certified that the Larson composite panel manufactured by Alucoil “has been appraised as having a Class 0 performance when fire tested and assessed” (Pasha-Robinson, 2018). This was signed by Sir Ken Knight (chief fire and rescue adviser in England and chairman for Warrington Certification). The certificate also states that "a material with a fire performance classification of Class 0 may be used...on external surfaces of multi-storey buildings" (Pasha-Robinson, 2018).

Sir Ken is now heading up the government’s independent panel on fire safety, which was appointed immediately after the Grenfell Tower fire to advise on building safety measures.

The reality is that “to comply with the current regulations, external cladding has to be put through laboratory testing or a “desktop study”, which allows a new product to be signed off if experts say they expect it to behave the same way in a fire as a similar product on the market” (Pasha-Robinson, 2018).

A preliminary report by chair Dame Judith Hackitt found that the system used at Grenfell was not fit for purpose, with confusing rules and a lack of enforcement allowing construction companies to abuse the system.

The Kensington and Chelsea council planning website shows the project’s status as ‘completed not approved’ but the council said this does not mean the project wasn’t formally signed off. According to the government website, a certificate should be issued within eight weeks of completion as long as building work complies with safety standards.

## ****conclusion****

The cladding panels and insulation used at Grenfell were never tested together before the fire. The specific cladding panels had been banned from use on tall buildings in the US and lots of warning had been given about fire risk for the specific aluminium cladding system.

The Client (Government), the Design and Build Contractor, the Fire department and the Building Control officers did not ensure the **project was safe for the end user.** This includes making sure neither your workers nor other people will be injured as a result of the building works. To not care about a person’s well-being or safety is unethical.

**Handing over to the Client a poor-quality project**, or one that is knowingly defective is also unethical. Frequently contractors knowingly hide mistakes and poor quality work. Grenfell Tower was done under a Design & Build contract. The contractor opted for a cheaper cladding system which was not fit for purpose and banned for tall buildings in the US knowingly.

The use of the non fire rated cladding panel resulted in the fire spreading rapidly, killing lots of people. The Contractor had signed a contract which binds them to delivering particular quality requirements and specifications. To deliver less is unethical.

**Deliberately omitting items,** or supplying products that do not conform with the project specifications or the contract requirements (such as fit for purpose) is also unethical. A Design and Build contractor could make a profit by purchasing substandard materials. This was the case at Grenfell.

The Contractor can of course argue that if a material or system is certified they have no reason not to specify it and this is true.

The Grenfell Tower cladding system should not have been certified as it was not properly tested. This is unethical, and this led to the Grenfell Tower tragedy.

In response to this paper a new research topic has been conceived. Namely the investigation on whether Building Information Modelling could be uses as a tool similar to the clash detection report to help identify risk of construction details that do not conform to adequate quality standards and could compromise the safety for the end user. The authors ar conducting further research to establish the invaluable possibilities of such a tool

### acknowledgments

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### References

Githunguri, L. (2014, October 1). Design liability in design and build contracts. Retrieved October 20, 2018, from http://constructionblog.practicallaw.com/design-liability-in-design-and-build-contracts/

Heritage, F. (2015, December 2). Government review to cut red tape for construction sector's small firms. Retrieved October 20, 2018, from https://businessadvice.co.uk/business-development/business-planning/government-review-to-cut-red-tape-for-construction-sectors-small-firms/

How 1999 Scottish tower block fire led to regulation change. (2017, June 26). Retrieved October 20, 2018, from <https://www.bbc.co.uk/news/uk-scotland-40406057>

Lakanal House: 'Missed opportunities to make tower safe'. (2013, March 28). Retrieved October 20, 2018, from https://www.bbc.co.uk/news/uk-england-london-21964325

Jessel, E. (22 May, 2018) Grenfell Tower insulation 'never passed fire-safety test'. Retrieved October 20, 2018, from <https://www.architectsjournal.co.uk/news/grenfell-tower-insulation-never-passed-fire-safety-test/10031286.article>

King, C. (2017, September 29). A Game of Risk: JCT Design and Build Contracts. Retrieved October 20, 2018, from <https://www.lexology.com/library/detail.aspx?g=682d0020-a7ae-4728-8457-611761b7888a>

Meyjes, T. (2017, June 22). Grenfell Tower refurbishment was 'not approved', according to council website. Retrieved October 20, 2018, from <https://metro.co.uk/2017/06/21/grenfell-tower-refurbishment-was-never-formally-signed-off-6723671/?ito=cbshare>

Forbes, N. (2017, July 6). Here's the real backstory to Grenfell – the Tory attack on social housing | Nick Forbes. Retrieved October 20, 2018, from https://www.theguardian.com/commentisfree/2017/jul/06/grenfell-tower-disaster-tory-attack-social-housing-public-sector

Lucy Pasha-Robinson @lucypasha. (2018, February 8). Cladding fitted to Grenfell Tower 'was never fire safety tested'. Retrieved October 20, 2018, from <https://www.independent.co.uk/news/uk/home-news/grenfell-tower-cladding-fire-safety-checked-acm-cladding-aluminium-composite-material-reynobond-a8200801.html>

Kleinfeld, P. (2017, November 22). After the fire: lessons from the Grenfell Tower tragedy. Retrieved October 20, 2018, from <https://www.designbuild-network.com/features/fire-lessons-grenfell-tower-tragedy/>

The Construction Index. (2017, September 27). Liability issues after Grenfell. Retrieved October 20, 2018, from <https://www.theconstructionindex.co.uk/news/view/liability-issues-after-grenfell>

Rovnick, N. (2017, June 29). Grenfell Tower: the cladding, the contractors and the chain of confusion. Retrieved October 20, 2018, from <https://www.ft.com/content/b8bb72d2-5c1a-11e7-b553-e2df1b0c3220>

Ireland, D. (2017, July 24). Social housing is being dismantled | David Ireland. Retrieved October 20, 2018, from <https://www.theguardian.com/housing-network/2017/jul/24/social-housing-dismantled-housing-associations>

Grenfell's long shadow: how the fatal fire became an ethical tipping point for Britain. Retrieved October 20, 2018, from <https://www.newstatesman.com/politics/uk/2018/06/grenfell-s-long-shadow-how-fatal-fire-became-ethical-tipping-point-britain>

23 March, 2018 By Geoff Wilkinson, & Andrew Chapman25 March, 2018 2:29 pm. The Regs: Current guidance on cladding post-Grenfell. Retrieved October 20, 2018, from <https://www.architectsjournal.co.uk/opinion/the-regs-current-guidance-on-cladding-post-grenfell/10029379.article>

Gerrard, N (2018, June 27). Building control divided over Hackitt recommendations | News | Construction Manager Magazine. Retrieved October 21, 2018, from http://www.constructionmanagermagazine.com/news/building-control-divided-over-hackitt-recommendati/

Dixon, S. K. H. (2017, June 16). Eight failures that left people of Grenfell Tower at mercy of the inferno. Retrieved October 20, 2018, from <https://www.telegraph.co.uk/news/2017/06/15/eight-failures-left-people-grenfell-tower-mercy-inferno/>

Evans, J. (2017, June 29). How lax building rules contributed to Grenfell disaster. Retrieved October 20, 2018, from https://www.ft.com/content/bf6bcbd0-5b35-11e7-9bc8-8055f264aa8b /

<https://www.centreforsocialjustice.org.uk/core/wp-content/uploads/2018/07/CSJ6364-Social-Housing-and-Employment-Report-180706-WEB.pdf>

How 1999 Scottish tower block fire led to regulation change. (2017, June 26). Retrieved October 20, 2018, from <https://www.bbc.co.uk/news/uk-scotland-40406057>

Letters. (2017, June 25). Grenfell Tower tragedy shows social housing system has failed UK citizens | Letters. Retrieved October 20, 2018, from <https://www.theguardian.com/uk-news/2017/jun/25/grenfell-tower-tragedy-shows-social-housing-system-has-failed-uk-citizens>

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