

# GRENFELL TOWER

# FIRE

## THE REAL STORY

FROM NATIONAL BUILDING EXPERT &  
CRITICALLY ACCLAIMED BEST-SELLING AUTHOR

REVEALING THE FLAWS



LANCE LUKE, CCC, CCI, CCPM

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# INTRODUCTION

This is the first time in the **Ask the Building Expert** series that we've created a book about a building located outside Hawaii and the United States.

This is the Grenfell Tower Fire - The Real Story.

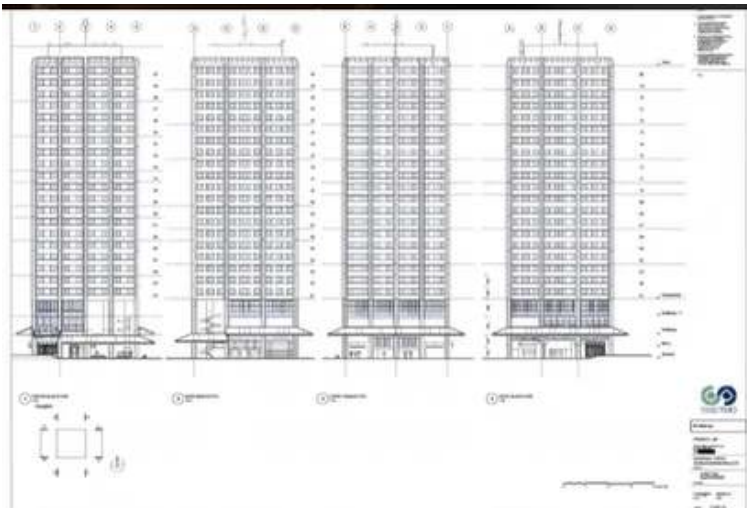


The Grenfell Tower fire was the largest high-rise fire in London, occurring in 2017, and it took years of thorough investigation to uncover all the details. As you can see in the picture on the previous page, everything is blackened and burnt. The only green things are the trees, about a block away from where the photo was taken.

In this book, you will learn about the causes of the fire, the design flaws, and other critical issues.

# CHAPTER I

# BUILDING CONSTRUCTION HISTORY



First, the building's construction history. The building plans were approved in 1970. Before that, architects were designing the building, and construction started in 1972, taking about two years. So, the construction period was from 1972 to 1974.

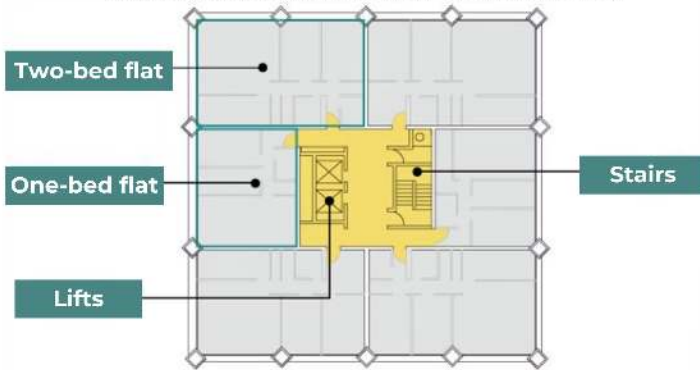
The building stood 24 stories tall and reached a height of 230 feet. It was an apartment complex, not a condominium, with 129 units.

In London, these units are called "flats," so they were referred to as "flats" instead of apartments or apartment units.

The big problem was that the building was designed with only a single interior stairway. Most high-rise buildings—in fact, all high-rise buildings in the United States—have two fire exits for emergencies, one on each opposite side of the building. However, Grenfell Tower was designed with only one interior stair.

Another major issue was the emergency evacuation plan in case of a fire. The rule for the building was to "stay put" or follow a "shelter in place" policy. This proved to be incorrect because people could not leave the building, which was another mistake.

**Typical residential floor in Grenfell Tower**



If you look at a copy of the plans, there is a schematic drawing of the building's different sides.

A floor plan labeled "Typical Residential Floor in Grenfell Tower" shows the units, including a two-bedroom and a one-bedroom, as well as the stairway.

At the core of the building, in the center, there are two elevators and an interior stairway.

This has proven to be the worst architectural design possible in the event of a fire or emergency. Can you imagine? With 24 stories and 129 units, you have hundreds of people living in the building. In the event of a fire, they all have to go to one stairway to evacuate or one bank of elevators in the central core. That is a recipe for disaster.

Not only that, everyone was trained that if there was ever a fire, you don't leave the building. Instead, you lock your door, stay in place, and wait until you're rescued. The problem was that the fire spread so quickly, people were trapped inside their units and couldn't leave. It was a major disaster.

So, a heads-up to architects and residents of condos or apartment buildings: if a building has only one interior stairway for exit, avoid living there. It's too dangerous. I work with high-rise buildings all the time, and it's critical that you have multiple emergency exits.

## Building Construction History



The building was constructed from 1972 to 1974. There was talk about a renovation because residents were getting too hot in the building. The idea for renovation came up, and the entire building was renovated from 2015 to 2016. They installed new windows, a new heating system, and a new aluminum composite cladding system.

The cladding system acts like a shade that covers the outside of the building, designed to prevent a lot of heat from the sun from entering the units.

When you have a shade that blocks UV rays and heat, your air conditioning works more efficiently, and the interior of your apartment stays cooler. That was the idea. However, the new aluminum composite system was later found to actually accelerate the fire. You will learn more about that later in this book.

## CHAPTER II

# LONDON HIGH-RISE BUILDING



There was a moratorium on building high-rise structures because the area didn't want to look like a huge city. However, due to demand, the moratorium was lifted in the sixties. For about 10 years, there were no high-rise buildings in London, and Grenfell Tower was one of the first built after the moratorium was lifted.

## CHAPTER III

# THE TRAGIC FIRE



Before discussing the cladding, I want to share the events that transpired in June 2017. This is quite depressing, but the information is important.

Seventy-two people died in this fire, and many more were injured. These are time-lapse photos, and there is also a photo of Grenfell Tower from May 2017.

One month before the fire, the building looked well-maintained. Then, on June 14th, tragedy struck, and at four o'clock BST (British Summer Time), the building was engulfed in flames.

About an hour and a half later, there was a lot of smoke, but the fire department had arrived. Then, about two hours later, you could see the black-gray smoke, which was evidence that the fire is being put out; you don't see any flames or anything. I should have warned you earlier about the photos because they're quite shocking, but these are the events that transpired.

Can you imagine a whole high-rise building under fire, in a blaze, in a matter of half an hour to an hour? It's terrifying. And people were inside that building, unable to get out. There is no way for them to escape because the rule was to shelter in place.

That turned out to be the wrong decision.

## CHAPTER IV

# FORENSIC INVESTIGATION



Through all of the investigations—by fire investigators, insurance personnel, fire department staff, and experienced professionals who investigate fires full-time—they determined that the fire started from a *defective refrigerator* and *electrical insulation* on the fourth floor, then spread throughout the entire building.

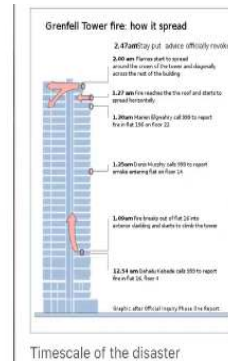
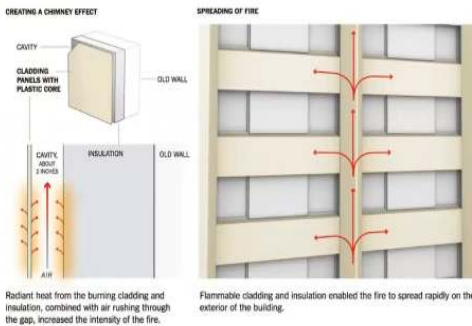
The image in the picture on the previous page shows the specific unit where the fire started. Can you imagine—with today's technology, they were able to pinpoint the exact unit where the fire began and determine its cause?

When there is an electrical issue in one unit and a fire starts, the fire is usually contained within that unit, or it may spread to nearby units. By that time, the fire department is notified, and the fire is typically put out.

However, this building did not have any fire sprinklers, which exacerbated the entire problem. So why did the fire spread to other floors?

# CHAPTER V

# BAD DESIGN, BAD FIRESCAPE PROTOCOL, WRONG CLADDING SYSTEM



Now, going back to the cladding system. The cladding system used was an aluminum cladding. If you look at the image on the left, the cladding consists of a core in the middle with aluminum panels on the outside, forming a "sandwich" structure. The cladding acts somewhat like plywood attached to the building wall.

The problem with the existing wall was that when they attached the cladding, there was airflow; the cutoff wasn't complete. The entire tower was covered with cladding on the outside, creating an airflow between the cladding and the wall.

Additionally, the inside of the cladding was made of combustible material. So, if you have a material that can catch fire and an airflow, combining these two allows the fire to spread.

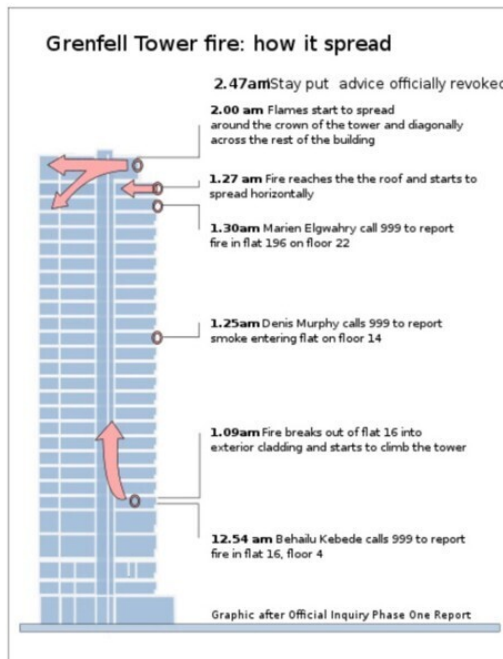
There was a cavity about two inches wide, intended for insulation. But when that insulation started burning and air rushed through the gap, it actually increased the intensity of the fire. If one area is burning and someone fans the fire, it intensifies—this is exactly what happened to the building.

For instance, when you go camping, if you're trying to light a small campfire and then fan it, the added oxygen makes it burn hotter. That is precisely the principle that occurred with this building.

## How did the fire spread?

Well, the cladding was flammable, and the insulation actually caught on fire and spread throughout the entire exterior of the building.

If you look at the image on the right, the fire started on the fourth floor and quickly rose, almost reaching the top floor and the roof in a short amount of time.



Timescale of the disaster

My belief is that if the building had not had the cladding, the fire would not have spread so extensively. What happens is that people had their windows open, and then the fire, which is on the building's exterior, caught the drapes on fire. Before you know it, everything is ablaze.

**That is why I'm saying the design was flawed. The materials were poor, and the fire escape protocol was inadequate.**

## CHAPTER VI

# MAJOR LAWSUITS

There were major lawsuits in 2009. Two years after the fire, multiple families sued the US cladding and refrigerator manufacturers, which were French subsidiaries.

### **Why is the US involved in a fire in London?**

It's because the materials were manufactured in the United States. Now you have cross-country lawsuits, and everyone is being dragged into it. This is another reason it affects the United States as well. The lesson here is to be sure of the design and fight for quality now.

Most people, when they go in and rent an apartment or buy a condo, ask about amenities like a swimming pool, a park area, and whether the building has a fitness center. All these things are nice.

But rarely is the question asked, “How many fire exits does the building have?” “How many elevators does it have?” “What is the building’s protocol in case of a fire?” “Are they in compliance?”

Not only in the United States but also in other countries, the same questions are being asked, no matter where you are. “Where are the fire escapes, and how many are there in the building?” “What’s the protocol for emergency evacuation?” “Does the building have proper signage?”

If you go on any floor of a high-rise building and you're not familiar with it, is there a sign somewhere that says, "In an emergency, here is where to go to evacuate"? Is there a sign that points to the emergency exits? Are there illuminated signs on each floor?

Let's say there is a power outage. Can you still see where the emergency signage is? When you open the door to the fire escape, will the light be on? Or is your building so old that it doesn't have an emergency generator, leaving it completely dark inside? These are critical life safety issues.

Unfortunately, for the people who passed away in this building, they didn't have the luxury of asking these questions. Worse yet, they were instructed to stay in their units. The problem is that the fire spread so quickly that these people were trapped in their units and ultimately perished. That is a tragedy. If they had been given the ability to evacuate, they might have survived. These are some of my main concerns with this situation.

Even if you're from a foreign country, there is an association focused on fire protection. In the United States, there is the National Fire Protection Association, with which I correspond to obtain more information on fire sprinklers, fire alarm systems, and life safety systems.

If you're from Hawaii, you may recall a major high-rise fire in a building called Marco Polo. Five people died, compared to the Grenfell Tower, where 72 people lost their lives. There is a stark difference in the number of deaths that occurred.

Basically, that is the gist of the story of Grenfell Tower.

The reason we created this book is that people had requested it before. I was initially hesitant to discuss it because it's a somewhat negative, depressing subject, and it wasn't a topic specific to the United States or Hawaii.

However, I decided to go forward with it so that the word could get out. If we can help even one person be safe and avoid injury, that's the whole idea.

## CHAPTER VII

# CONCLUSION FROM THE BUILDING EXPERT



If you're in a high-rise building that does not have fire sprinklers, I urge you to speak with your condo board or apartment building owner about installing fire sprinkler systems. If that's not possible, consider upgrading your fire alarm system.

There are certain life safety components that are critical in the event of a fire. Most people think that nothing will go wrong with their building, but you never know when a fire can occur. It could be an unattended fire where someone is cooking or an unexpected electrical fire.

If your building is around 35 or 40 years old and has never had an electrical inspection or upgrade, I highly urge you to take whatever steps are necessary to get that done.

Electrical issues are another concern. Electricity may cause a fire, which is well-known, but there are also other ways fires can start. It could be from someone smoking, a lit candle that falls and starts burning nearby items, or someone cooking who steps away for a moment. Before you know it, the whole kitchen could be on fire.

There are different ways to prevent a fire. However, there are also situations where you can't prevent a fire because you don't know what's happening. There could be a spark or a short circuit where you didn't expect it.

You never know when a fire is going to occur, but you can take necessary steps to reduce the risk. If there is a fire, you want to ensure that the occupants in the building can properly evacuate. They should not get confused, trapped, or experience similar issues.

CHAPTER VIII

# QUESTION AND ANSWER

***"I live in a condo high-rise building. How can I be sure that the building is safe from fire? I don't trust the board or property management."***

One thing you can do is request that your management company or the board contact the fire department and have them come out to do an inspection. You can ask when the last time was that the fire department came to the building for an inspection.

Alternatively, you could call yourself, request information, and say something like, "I'm not sure if the board or the management company is really on top of things. Can you help? Can you check? When was the last time you came out?"

Or you could call up yourself, request information, talk to them and tell them, "Hey, I kind of don't know if the board or the management companies are really on top of things. So can you help?" "Can you check?" "When was the last time you guys came out?"

"Can you give us tips on evacuation? Can you review our building's evacuation policy and let us know if it's effective, or if you have any other recommendations for us?"

You might want to be more proactive by attending board meetings and bringing up the subject. You could say, "You know what, I'm concerned. I would volunteer to chair our life safety committee." Or, "I will be the chair of the fire protection committee, or whatever you call it." Even if they don't have one, you could say, "Can you consider creating one?"

Alternatively, you can be even more proactive. If you're really concerned, be the squeaky wheel and keep pressing the issue. Attend every board meeting, bring up the same subject repeatedly, and send letters to the board and the management company. Do your research on high-rise evacuation procedures and send copies of relevant articles to your board and management company.

The more you do that, the more they're going to say, "You know what, we either agree, or we're so sick and tired of hearing this person complain that we're going to do something about it. So if you need help, contact us, and we'll give you more ideas." That is an important subject to bring up.

***"My building is 60 years old and has never had any upgrades to the fire alarm or electrical system. Should I be worried?"***

I would be concerned because your electrical system and fire alarm system don't last forever. If you look at the lifespan—and I'm assuming you live in a condo—you could refer to the reserve study to see what the expected lifespan of these components is. If the reserve study was properly completed by a certified reserve study professional, then it should be fairly accurate.

For electrical and large systems, the 35- to 40-year mark is a critical point. Anything beyond that is questionable. So if you're in a building that's 60 years old and you've never had an inspection of your electrical system, you're about 20 years overdue. The fire alarm system is equally important.

A lot of times, it's like, if you don't see it, you ignore it. Or, if it's working, then it's not a big deal. But these are not the kinds of components you should wait to fail.

These are components where you need to catch issues before they fail, because if they do, it's already too late.

For instance, if your fire alarm system is old and there's a fire in your building, and someone pulls a pull station but the bells don't ring, then what happens? It's too late at that point. You want to have it tested and working.

A lot of times, condo boards don't have the money. So they say, "We haven't had any problems with the electrical system. Let's just extend that line item another 10 years on the reserve study." And then what happens is you have a component that was meant to last 40 years, and now the reserve study has extended it to 60 years. Then you keep doing that. Eventually, you realize, "Wait a minute. We're doing a disservice."

It's not about money; it's about saving people's lives. Electrical and fire alarm systems are very important components in a high-rise building.

***"Does Honolulu have a mandatory building inspection program like in Surfside, Florida?"***

The answer is no; there's no such mandatory building inspection. I tried to get a bill introduced regarding mandatory inspections, but it was shot down by professionals in property management and condo boards.

The reason is they didn't want to spend the money. It cost too much, so it became a money issue over a safety issue. The only mandatory inspection now is a fire life safety inspection on older high-rise buildings. And that's mandatory.

Other than that, there is no mandatory structural inspection for concrete spalling, corroded railings, outdated electrical systems, or old fire alarm systems. It's like a policy where, "Oh, we don't need a mandatory inspection because every building is going to monitor their own building, monitor their own components, and do their own inspections."

How can you have self-monitoring when, historically, if I did a survey today, most of these buildings didn't get inspections done? So, self-monitoring doesn't work in a condo setting because most people are not doing it.

We have reserve studies done. But a reserve study is not an inspection and testing; it's not a detailed inspection for each of these components.

A reserve study professional is not going to bring out \$10,000 worth of electrical testing equipment to test your electrical systems. They are not going to test your fire alarm system either. They will only look at when it was last upgraded and plug in numbers for things like failing cast iron piping or spalling. They're not inspecting like an inspector; they're inspecting only for reserve study purposes. There's a big difference.

***"Does the US building code differ from the European building code?"***

There is a difference. I'm very familiar with the United States Building Code, the International Building Code (IBC), and the IRC, or International Residential Code. But there are other codes that I'm not as familiar with, like the European building codes, although I've read sections. For the most part, the codes are basically similar, with some fine-tuning here and there that differs. In general, they're quite similar.

Certain things may differ in specificity, but overall, it's pretty much the same, like the fire code and the building code. So, there isn't much difference, but it's not exactly the same either.

I know in the US, building codes change every three years. I'm not sure what that time frame is in the UK or elsewhere. I don't specialize in UK building codes or building codes in China or India. However, I did research the building codes in Hong Kong, and they were quite lax.

Some foreign countries are really lax in their building codes. I know the United States tries to keep up and make it as safe as possible. But of course, anytime you do that, it increases the cost of construction.

***"Are you aware of any Hawaii lawsuits  
resulting from unsafe buildings?"***

Yes, there's actually a whole bunch. One is the Marco Polo case—there was a lawsuit because of the fire. But was it because of an unsafe building, or was it due to something else? Now there are allegations that certain components in the building were not up to code or up to par. You could put that on the list.

Another case is the Ala Moana shopping center, where they had a corroded railing, and two men fell off. The railing had collapsed, and as a result, one person died and the other was permanently and seriously injured. That was another lawsuit. I actually served as an expert witness in that case.

There are other cases where certain parts of an apartment or condo building collapsed, leading to litigation. I am still working on a few litigation cases as an expert where there was a failure of certain building components that caused problems.

Yes, and there will be more, but as time goes on, it's important to get your buildings fixed up and maintain them. If you are an apartment or condo owner and you neglect certain things, tenants can file a lawsuit against you for not maintaining the building or failing to fix issues in their units.

Another thing is that if you're in a shopping center, office building, hotel, or golf course, your employees or visitors could get hurt if something is not safe. If they slip and fall, they can sue. That's why there are premises liability lawsuits and slip-and-fall or trip-and-fall situations. People can sue for almost anything at any time.

The key is whether the causation of the lawsuit is valid—whether they can prove that they got hurt because a component did not conform to the building code, was unsafe, or was not repaired.

For example, if you're in a parking lot with potholes and you happen to trip and fall, it's not acceptable to say, "Oh, well, all roads have potholes.

Next time, watch where you're walking." No, that's not the case. That is a matter of neglect and lack of maintenance, poor upkeep. So that's just an example.

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For any inquiries related to this topic, visit, <https://search.app/SCgX8LEk7E74dbcu8>

**END**

# ABOUT THE AUTHOR



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Lance Luke has been in the construction and real estate industry for over 43 years. He is a former general contractor and worked as a construction and project manager for real estate development companies. Currently he owns an independent construction consulting company, Construction Management Inspection, LLC. He has experience in design, engineering, construction inspections, construction management, reserve studies, real estate development, property management and condo association management.

His specialty is in inspection and construction management for condo association buildings and commercial properties. Various types of projects worked on include concrete spalling repair, painting, roofing, waterproofing, asphalt resurfacing, plumbing re-piping, electrical retrofit and structural wood repair. He provides construction oversight and progress inspections for residential and commercial projects. He

has 43 years managing capital improvement projects for condominium associations.

Lance Luke serves as an expert witness on construction and real estate litigation cases. He was formally an Advisory Board Member for the State of Hawaii Regulated Industries Complaints Office, as an expert consultant (for over 15 years). His expertise was in helping to resolve complaints filed with the Contractors' License Board. He was also selected in 2017 by Honolulu Assistant Fire Chief to serve on the RFSAC (Residential Fire Safety Advisory Committee) Building Code Subcommittee to prepare the Fire Life Safety Evaluation criteria.

He has written numerous articles on construction and inspection, which have published in both local and national media. He conducts up to 30 presentations a year to the construction, real estate and property management industry including educational webinars and construction seminars.

Three-time Best-Selling Author on subjects of construction management and building safety. Numerous articles published in national construction, design, and building management publications.

Featured guest on national media shows such as Times Square Today and Hollywood Live which were broadcast on national media outlets such as ABC, CNBC, CNN, NBC, Fox Affiliates, A&E, and Bravo.

Mr. Luke is a qualified insurance inspector and an approved Federal HUD Construction Inspector. HUD projects included "from the ground up" assisted living

facilities such as Plaza at Moanalua (2012), Plaza at Pearl City (2014) and Ilima at Leihano (2016) He is also listed as one of America's Premier Experts and Marquis Who's Who in America 70th Anniversary Edition. And is an instructor for National Seminar Providers such as Lorman Education Services, Compliance Prime, and Half Moon Education Seminars.

Lance Luke is a former member of the Structural Engineers Association of Hawaii and the American Bar Association serving on the Real Property/Probate Law Division and the Forum for the Construction Industry.

The National Building Expert Lance Luke shares his tips on Building Safety for Buildings large and small. He shares his 43 years of experience in the construction industry.

His webinars on building and construction topics draws audiences not only from the Unites States but from all over the world.

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