

FIRE/LIFE SAFETY IN HIGH-RISE BUILDINGS

FROM NATIONAL BUILDING EXPERT &
INTERNATIONAL BEST-SELLING AUTHOR

KEEPING SAFE IS EVERYONE'S PRIORITY



LANCE LUKE, CCC, CCI, CCPM

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"The Word According to Luke" Series

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Introduction

Lance Luke here. I'm the National Building Expert, and we have put together a series of books called Ask the Building Expert Series.

Why did we do this? Because we want to provide valuable information and to help building owners, condo associations, property managers, homeowners, condo owners, Realtors, and many other people.

A very important subject; Fire/Life Safety in High-Rise Buildings.



Just to give you a brief background on the day of the Marco Polo fire, I was there that day, weeks after that, and months after that. And I have an idea of what happened. I also inspected the building prior to the fire, so I have a lot of information that I could share.

That's the history in Honolulu and that's how this whole thing came to be. There was a requirement to have the Life-safety evaluations, that was completed two years ago, but they kept pushing it further in the future because many condos were not in compliance and they needed more time. So that's basically where we are today.

CHAPTER I

History of Fire Life Safety Evaluations

Let's take it from the beginning about what the history is of fire/life safety evaluations. I will be mainly talking about what happened in Honolulu.

Just a little background on what happened in Honolulu; then I'll go into the rest of the information that would apply to any city or state throughout the United States, and even countries around the world.

A little bit about what happened in Honolulu. The history of the life safety evaluation stems from this major fire. The biggest residential fire in Honolulu happened in 2017 in a building called Marco Polo.

If you're not familiar with that, it was pretty huge and five people died in the fire. I'll let you know the problems associated with the safety in the building.

After the fire in 2017, the mayor of the City and County of Honolulu met with the fire department and came up with a plan.

Basically, it was to require all high-rise buildings in Honolulu to be retrofitted with fire sprinkler systems; even if the building didn't have fire sprinklers when it was built.



CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

ORDINANCE 19-4

BILL 96 (2018), CD1, FD1

A BILL FOR AN ORDINANCE

RELATING TO FIRE SAFETY.

BE IT ORDAINED by the People of the City and County of Honolulu:

SECTION 1. The purpose of this ordinance is to clarify the intent of Ordinance 18-14 and address implementation issues relating to fire safety measures and assessments enacted by that ordinance for the protection of persons and property in existing high-rise residential buildings.

SECTION 2. Section 20-1.1, Revised Ordinances of Honolulu 1990 ("Fire Code of the City and County of Honolulu"), as amended by Ordinance 18-14, is amended to read as follows:

***Sec. 20-1.1 Fire Code of the City and County of Honolulu.**

The State Fire Code, as adopted by the State of Hawaii on August 15, 2014, pursuant to Chapter 132 of the Hawaii Revised Statutes (HRS), which adopts, with modifications, the 2012 National Fire Protection Association (NFPA) 1 Fire Code, published and copyrighted by the NFPA, is adopted by reference and made a part hereof, subject to the following amendments which, unless stated otherwise, are in the form of amendments to NFPA 1:

- (1) Amending Section 1.1.2. Section 1.1.2 is amended to read:
1.1.2 Title. This code shall be known and cited as the "Fire Code of the City and County of Honolulu" and will be referred to herein as "this code."
- (2) Amending Section 1.10. Section 1.10 is amended to read:
1.10 Board of Appeals. See Chapter 16 (Building Code), Article 1, ROH.
- (3) Amending Section 1.12.8. Section 1.12.8 is amended to read:
1.12.8 Permits, Licenses, and Fees. A permit or license shall be obtained from the Honolulu Fire Department's (HFD) Fire Prevention Bureau or designated agency prior to engaging in the following activities, operations, practices, or functions:

It was a mandate to require these older buildings to now install fire sprinklers in their buildings. And there was a lot of support from the building industry and engineers who actually do this kind of work.

Of course, the fire department was in supporting the approval. But there was pushback with condo owners, boards, property managers saying that the cost of these fire sprinkler systems are going to be too great and condo owners can't afford to pay for it.

After the fire, there was a committee that was put together by the fire department supported by the City Council and the mayor. It was a committee called The Residential Fire Safety Advisory Committee, and I was on that committee on the building code section.

CHAPTER II

Why are Inspections needed?

Inspections/safety for are needed because of the reliance on each condo building or apartment building. Building that don't have fire sprinklers and needs sprinklers. They weren't really paying attention to that safety issue, and it could also be a financial aspect.

But inspections are very important because it could prevent fires from happening. And also if there is a fire, it could prevent a loss of life or injury.

The photo is an actual picture of Marco Polo.





In this photo, I'm standing with a news reporter for Khon2 News, and we are standing in front of the Marco Polo building where I was interviewed.

CHAPTER III

Fire Sprinkler Systems

Fire sprinkler systems are actually required in certain parts of a building. In the '70s, they were required if you had a high-rise building, a trash chute, and underground parking. It was not required inside the building units, and this is in the '60s and '70s.

Sprinklers are required in high-rise buildings, but you may be wondering, "What is a high-rise building?" The majority of people believe that a high-rise building must be at least 40 stories tall.

The fact of the matter is by building code, a high-rise building is considered a building that has a height of 75 feet and higher. You may ask, "75 feet, how did the code people come up with that criteria?"

A single story of a structure is between eight and ten feet high. Suppose a typical floor height in a building is 10 feet; you are only discussing seven- or eight-story structures. The structure is 70 or 80 feet tall, but according to the building code, it is a high-rise.

So, how did the 75 feet come to play? Because that's the height that the fire department ladder can reach up to a building.

If you have a 10-story building and the fire department arrives with its long ladder, it will not reach the top floor. Therefore, if the fire department ladder cannot reach the upper floors, the entire structure must be equipped with a fire sprinkler system. And this is how everything came to be.

If you go into a store, warehouse and restaurant, and you look up at the ceiling, you might see piping and the sprinkler heads. Then you know that the building has fire sprinklers.

While on vacation, if you check into a hotel, if you should search for sprinkler nozzles.



Here are some images of actual fire sprinkler heads that got set off and had water shooting out of it.





Now you may ask, what is the difference between as far as timing. If the fire station was right next to our high-rise building, why would I need fire sprinklers, because they're right next door?

The fact is, if your building is equipped with a sprinkler system and there is a fire and the sprinklers activate, you will be safe. Water begins extinguishing the fire.

That is significantly quicker than the fire department driving to your building next door and ascending the stairs to extinguish the fire. It may take 10 or 20 minutes, but once the fire sprinkler is activated, it is immediate and occurs within minutes.

If your building does not have fire sprinklers, you cannot rely on the fire department to save you. Therefore, everyone in the firefighting arena supports the installation of fire sprinklers in high-rise structures.

CHAPTER IV

Buildings without Sprinkler Systems

How many high-rise buildings in Honolulu do not have fire sprinklers?

Here's a photo of a lot of buildings and some of these buildings do not have fire sprinklers, some of them do. This is just a representation of lots of high-rise buildings in Honolulu; thousands of buildings.



Some of the cities that have high-rise buildings without sprinkler systems are San Francisco, Los Angeles, Chicago, New York, Dallas, San Antonio, Texas, San Jose, San Diego and Philadelphia.

I have been to most of these cities and I actually saw high-rise buildings with no fire sprinkler systems. So, it's not only a problem in Honolulu, it's a problem throughout the whole United States with older buildings that are eight floors and above without sprinkler systems.

In Hawaii, approximately 340 structures in Honolulu lack fire suppression systems. Why? Because it was not mandated by code at the time the building was constructed. And because many people were unwilling to upgrade due to the high cost. Therefore, it was not installed.

CHAPTER V

Fire/ Life Safety Components

What are the components that fall under the fire/life safety category?

- Wet and Dry Standpipes
- Fire Hoses
- Fire Extinguishers



Some of the components are wet and dry standpipes. What are those big pipes that go up to the building, some of which have standing water in them and some do not? It is a wet standpipe if there is water in it all the time, and that's why it is called a wet standpipe.

Normally fire hoses that are in the building, if your building has one, it is connected to the wet standpipe and if you turn on the valve, water comes out of the fire hose.

A dry standpipe contains no water, the dry standpipe system is for use by the fire department.

Let's say you have a fire in your building; the fire truck would come and the fire fighters will find the nearest fire hydrant and then they will hookup their hose to the hydrant. From the fire hydrant, they pump water into their truck then into that dry standpipe and water is pumped through the building.

When the water goes through the building, the dry standpipe becomes a wet standpipe and that's what the firefighters use to put the fire out.

You also have the fire hoses and the fire extinguishers. So that's part of a life safety component.

- **Fire Alarm**

A fire alarm system is a series of pull stations and bells and if you have a smaller building, you may have one bell, or two bells per floor.



The objective is when someone pulls the alarm or the pull station, the bells go off. In older apartment buildings and some condos that I've been inspected, they did a test of the bells and some of the bells did not work, or some of the bells were not loud enough.

If you're in a condo and you're in the bathroom and the alarm goes off, you're not able to hear it. That's why an upgrade of a fire alarm system would actually do that. They test the sound of the bells, how loud it is. The upgrade today is they have a voice activated and sight activated systems where there's a flashing light that goes on for people who can't hear.

- **Smoke Detectors/ Alarms**

Do you know what the difference is between the two?



I take a poll and even though the stores that sell these devices, of course, most of the products come from China. They're not labeled correctly; they say, smoke detector and those are the ones that you buy and you put the battery in and put it on the ceiling or on the wall in your house. That's not a smoke detector, it's actually a smoke alarm and here's the difference.

A smoke alarm is a single device. When it sets off, only that alarm goes on and sounds. A smoke detector is a series of these devices connected, when one alarm goes off, the other ones go off also.

Let's say you have a smoke detector in a high-rise building, when that detector goes off, other detectors downstream will go off also. A smoke alarm, it's just only heard in one unit. So that's the big difference.

CHAPTER VI

Fire/Safety Upgrades

Suppose you have an antiquated building, and by the way, this applies not only if you're a condo owner, board member, or property manager, but also if you're a Realtor, real estate agent, or condo buyer interested in purchasing a condo. Even if you are a buyer, for example, the person purchasing the condo unit and the Realtor representing the buyer; it would be wise to determine whether the building or condo unit you are selling has a fire sprinkler system.

I believe that this is a very important factor. And many purchasers will turn away from a building without a fire sprinkler system.

- **Fire Sprinkler System**

If you are in an existing high-rise building and do not have a fire sprinkler system; it would be best to have one installed. If you do have a fire sprinkler system, the upgrade would be an inspection of the fire sprinkler system and added areas that were not sprinklered.

If you look at the image, you have sometimes a condition where I see the fire sprinkler head is so corroded. Because we have a lot of salt air in Hawaii the device is made out of metal and it starts corroding. Now, guess what? If there's so much corrosion on it, it's not going to work.



So, if there is a fire, it's not going to spray water, and it's just not going to do anything.

The other thing to be concerned with is, if you have a sprinkler head and you're renovating, or you're painting a common area, do not paint the sprinkler heads. Sometimes they miss or they're spraying the ceiling and they spray the sprinkler head.

If the paint gets clogged in the sprinkler head, guess what? It's not going to work. That's just some tidbit information for you to share.



- **Fire Alarm System**

Also upgrade your fire alarm system. Some fire alarm systems are so old, they don't work properly. If your fire alarm system is 35 years, 40 years old, it's time for an upgrade.

No matter if your fire alarm company comes in and services and it tests it and it still works; it's probably aging and one day it may not work.

So, it's best to check the reserve study and follow that.

- **Fire Exit Signage**

Also, fire exit signage is important. If you have fire exit stairways, then you've got to have proper signage.

If there is a fire and there are no fire exit signs displayed on the door, you cannot expect people to know that this is the way out of the building.

Therefore, you must have both signage and adequate illumination. Ensure that there are floor numbers on each floor and on the entrances of your fire exit stairways.

It is important not only for the people to know which floor they are on, but also for the firefighters.

- **Emergency Lighting**
- **Smoke Alarms**
- **Smoke Detectors**

Make sure all the emergency lights work properly and smoke alarms are tested. Smoke alarms should be in every single condo unit and I know it's harder to enforce because the smoke alarms are in each private unit.

Normally the property managers don't go into each unit and look to see if there is an alarm. If there is, is it working?

Believe it or not, it's required by code to have smoke alarms, and even the landlord tenant code requires them. And then concerning smoke detectors, make sure you have enough of them and make sure they work.

What happens in a building with emergency illumination when the power goes out? Are reserve batteries present? Have you developed a backup system? I am aware that older structures lack emergency generators.

So guess what? Everything shuts down during a power interruption. Your staircases' emergency illumination is not activated. If the battery backup is malfunctioning and your elevators are not operating, your alarm system may not be operational.



It would be advantageous if your high-rise building had a backup generator. If not, take the necessary measures to have one installed, as it could prove invaluable in an emergency.

You don't know when the power is going to be out. Sometimes the power is out for six hours, 12 hours, and that may not be too bad. But what happens after hurricane where some buildings have no power for a whole week; then what do you do?

Additionally, you must be mindful that there may be elderly residents in the building who require electricity to power their oxygen machine or whatever else they require for life safety. That is also essential.

- **Fire Exit Doors**

Fire exit doors in common areas, in the hallways; please and make sure that the doors work and are not corroded. You should have panic hardware which opens the door with a push.

What is panic hardware? Panic hardware is a door that you don't need a key and you don't need to turn the knob. You just push on the little bar and the door opens. Normally these are for big corridors, and meeting rooms.

If you have a common space such as a corridor or passageway, you must install exit doors. These doors are all equipped with automatic closing and locking mechanisms. This means that when the door is opened, it will close automatically. Because these are fire-rated doors, the door closes behind you when you depart. Also, ensure that there is adequate signage.

If you look at the image with the two red doors, how do we know what kind of doors they are? There's no sign.



There should be an exit sign, like the other image. There is a nice door there and an exit sign.



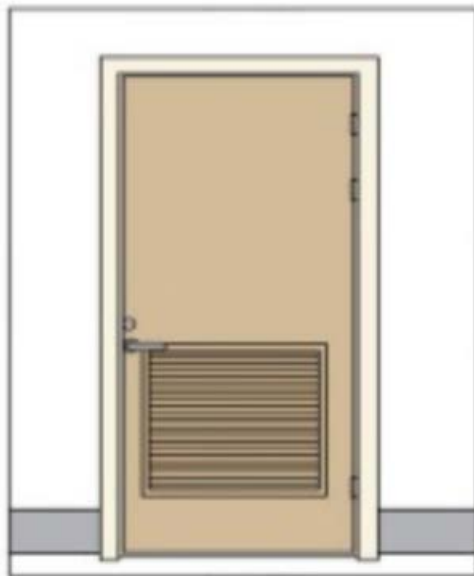
Here is something to consider, if the door is too hard to open or it's so corroded or rusty; and maybe through shifting the door is not fully plumbed and you have to kind of use your body to open the door or close it.

That's not a proper working fire door. Corrosion or rust on the bottom of the door, where there are holes, all this is not a legal fire door either because there are holes in the door.

- **Front Unit Entry Doors**

Most people do not know that in a condo or apartment building, your front unit entry door is considered a fire door. When the door is considered a fire door, it cannot have any louvers in it, it has to be solid.

If you look at the image, that's a front unit entry door to a condo and there are louvers. Why are there louvers; well for ventilation. But ironically, that's not allowed by code. You cannot have any louvers.



If you have a screen door and the inside of the unit gets hot, some people leave their entry door open, and they have the screen there for ventilation. That is not allowed either.

If you look at the image, that fire door was propped open with a doorstop for ventilation. That is illegal. By fire code, you cannot have a unit entry door left open. That's a fire rated door propped open, you cannot have louvers in it, or a hole in it for your pet.

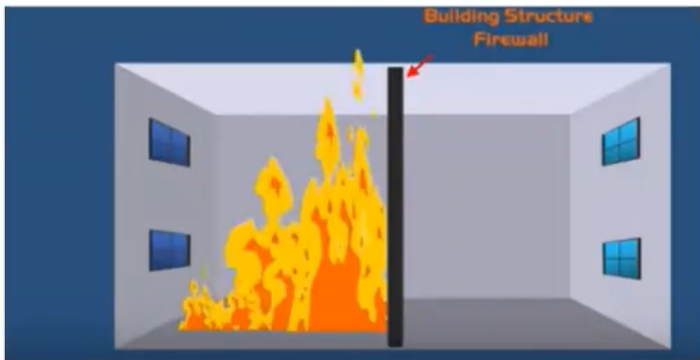
Therefore, it is crucial. In fact, Marco Polo suffered from some of these conditions.



- **Fire Wall**

If you look at the image, it is a picture of two separate condo units or two separate apartments. And the wall separating the two units is considered a firewall that has to be properly fire rated.

Therefore, if a fire begins in one unit, it will not spread to the other unit and engulf the entire building.



Typically, a firewall is composed of concrete, hollow tile or fire-rated drywall. The concept behind the design is to create compartments and a contained single unit. If constructed properly, a fire would not extend to the unit next door or above or below.

- **Fire Stopping**

Talking about above or below, there is what is called fire stopping. In every building, they have floor, wall, and ceiling penetrations through the concrete; why? Because they have piping such as drain piping, supply pipe to carry water, electrical conduits, storm drain piping and so forth.



So, what happens is when the pipe is going through the ceiling, wall, or floor, and there is a hole there where the penetration is. If you don't have the hole sealed, that's a way for the fire or smoke to get through to other units in the building.

The material used to fill or patch the holes is called fire stopping, and the method by which to seal the holes is also called fire stopping. The material is also known as fire stopping material.

In Marco Polo, there was no fire stopping. There were openings present, so if one unit were to catch fire, the flames could easily spread downward, from the top to the bottom and then throughout the entire structure. Not only the flames, but also the smoke, which frequently kills more people than the fire itself.

In conjunction with this, if you examine the windows of a condo building, you will notice that the wall in the window is known as a window wall, and it is a system that connects the floors of each unit.

This compartment must also be protected against a fire; a process known as fire saffing. The older buildings had a window wall system, consisting of a wall on the floor and a window on the top of the wall.

Now, if you look at how high-rise buildings are built today, it's mainly all glass, right? There is no concrete wall or anything and that's called a curtain wall system.

In some buildings, their wall is an entire window and that's called a window curtain wall because your whole wall is basically a window.

Similarly, the space between a window and the floor must be fire-rated. I've observed old structures with no insulation, just air or newspaper. Is newspaper a suitable material? No, it is not approved as a fire rated material.

In a bunch of construction defect cases, those things came up. The fire saffing was not done properly or wasn't installed, and fire stopping wasn't installed.

CHAPTER VII

Safety First in all Buildings

My motto and your motto too, is “Safety First in all Buildings, Safety Starts Here.” Why? Because we want to be able to protect lives.



CHAPTER VIII

Safety Recommended Options

- You can take immediate action to upgrade
- Do not wait.



I am fully aware that it costs a lot to upgrade. And in reserve studies for a lot of condos, every single building that had a reserve study done for a high-rise building did not have a line item for a new fire sprinkler system.

If these condominiums lacked a sprinkler system, the fire would have been unexpected and no one would have been prepared. If you aren't prepared, if it isn't in your reserve study, and if you don't have that kind of money lying around, you may suddenly believe that you need to install a fire sprinkler system. How are we going to pay for it?

Thus, the issue is money. How do you pay for it? How can a condo board agree to pay for a significant component if it never had the funds for it? How are these condominiums covering the costs of concrete spalling repair, elevator replacement, roof repairs, and cast iron pipe replacement?

If they do not have sufficient funds, they have to get a loan or mandate a special assessment, neither of which are desirable options.

Basically, that is the information presented to you today. I want to let you know our upcoming books that we planned for future topics, on building safety and preventive maintenance.

The website is askthebuildingexpert.site, and you can register for future books.

CHAPTER IX

Question & Answer

"Your presentation is about building owners and helping them, but I just want to share my experience and it actually just happened in the last week. What you're sharing is really important for travelers that they don't realize because my wife and I have traveled so many years in our retirement, all around the world."

This information regarding life safety is something that you, as a traveler, must be aware of. When traveling, be mindful of the hotels and other lodgings you choose. Because we did a little staycation, I believe that all hotel guests should be aware of the location of the hotel's exits and sprinklers in case of an emergency. In the hotel where you are staying, it is essential to know how to exit in the event of a fire or other emergency.

As a result, my family and I always look for for the exits and where all the safety systems are so that we'll be ready if an emergency comes. We've heard about those kinds of stories and these resorts where they had fires and that kind of stuff, and its good information.

I know you travel a lot. My wife and I like to travel also. We've been to many countries and stayed at different hotels in Europe and also throughout the United States.

One of the first things I do when I'm walking from the lobby to the hotel room is look around at the signage and trying to plan and get familiar with the fire exit. Where it is and it has to be posted for proper the signage.

In your room, whatever floor you're on, there has to be a sign saying, arrows pointing to the exit in case of a fire and I've been to hotels and I'm actually kind of a snoop because I like to inspect things.

Even if I'm a hotel guest, I'm going down stairwells and looking at things because that's what I enjoy doing. In some cases, they were major hotels, I don't want to mention names.

They had lumber materials, maintenance employees' tools, and a shopping cart full of cleaning supplies stored in the fire exit stairwells while construction was ongoing. And that is prohibited by the code. Why is it forbidden to obstruct or store items in the stairwells leading to the fire exit? For apparent reasons; if there is a fire and people need to evacuate, the passageway must be clear.

I also look at the hotel room where the smoke detectors are and see if they're even working. Let me stray a little away from this fire/life safety topic.

I thoroughly examine the floor and all utility fixtures. I literally check under the sink to see if there is a leak, and even five-star hotels may be unaware of leaks.

By the way, I take pictures of all that stuff and post them on Facebook. In the beginning, I used to not say the name, but now I don't care, I just take a picture of the name of the hotel, and then I put pictures of all this bad stuff, just so that they know.

Hopefully, the issues will be resolved by the time I check out. I tell the manager and say, "By the way, these are things that I think you should improve on, I'm a national building inspector" and they go, *"Okay, we'll follow up on it, Sir"*.

“Do you know how many buildings in Honolulu have opted in for fire sprinklers so far?”

According to my research so far, two of the buildings that I'm aware of, out of 340 have decided to install fire sprinklers.

Based on the latest Honolulu fire department survey, out of the 340 buildings that were required to have their fire/life safety evaluation completed, only 102 buildings have completed them.

They were supposed to have completed it last year. So out of 102 compared to 340, that's not a good number and that's less than one third of the buildings have complied with the ordinance to have the fire life safety survey completed.

Then out of the 102 buildings that had their evaluations done, only six (6) of the buildings passed. So, what does it tell you? That tells you that the majority of the buildings did not pass and we have a serious problem here with our life safety situation.

If you need further information, you can check with your Honolulu City Council member or the Honolulu Fire Department.

“What is the average cost of fire sprinklers for a condo building? And what is the estimated cost of upgrading a fire alarm system?”

Let me just give you an estimated range on buildings that I have looked at and have been working on. The cost of a fire sprinkler system is about \$15,000 to \$18,000 per unit and that's just a range because every building is different.

Keep in mind that it's not only putting piping in the building and then into the units. It's the piping, fire sprinkler heads, it's for a fire pump that needs a separate space, a water meter for that and there's a lot of factors that go into designing the whole system.

If you hire an engineer to design a system, which you need to, you may be talking \$50,000- \$75,000. The cost is not cheap.

For a fire alarm system, if you take a 17-story building that has maybe 130-250 units, the prices that we're looking at is about \$750,000 to \$950,000 to upgrade the fire alarm system.

It depends on the condition of the system and then other components that are needed to be upgraded. So, that's just a ballpark figure. As you can see, it's not cheap. If you have a condo building and you multiply \$15,000 per unit, it's millions of dollars for a fire sprinkler system.

That's the reason why some of the of condos have decided to opt out because it's too costly. Now be aware that if a condo building ops out, they cannot just arbitrarily say, "We're not going to install our sprinklers."

There are certain things that they've got to do, they actually have to post signage in a conspicuous area of the building and maybe the lobby that says our building does not have fire sprinklers. (Note: A new law was passed recently waiving this requirement.)

They have to let the management company know, so that if potential buyers are looking at turning offers in it, they're aware that there are no fire sprinklers and that's just what the law says.

Also, there is compliance with other things that need to be done. For instance, if they even decide to put fire sprinklers, they still have to upgrade the fire alarm system, if the system is not working.

It's just a give and take kind of situation. We're still going through this whole process and definitely there's going to be a lot of appeals to the city saying "We're XYZ building and we need more time to get our survey done. Or we had our survey done, we didn't pass and we need more time to fix all these things. We need to upgrade our fire alarm system, do fire stopping and all that."

There's no way in Honolulu, there's enough contractors to do the work, to upgrade systems for 340 buildings within three years' time, that's not going to happen. So, we'll see.

“Does the fire code require exit stairways to be pressurized in a high-rise? And if so, is there a testing protocol for that?”

The answer is no and yes. It depends on the age of the building and the design. Newer buildings today, like all the ones in Kakaako, most of the buildings are all designed with that type of system.

The older buildings before that, nothing is pressurized, you have a hallway with airflow and that was the old system which works, but the standards today are getting so technical.

Basically, if you have a separate air system in the hallway, that's connected to the HVAC system of the building. It all depends on the type of building, the newer buildings, yes. They have that system and have pressurized stairway systems in the fire exit stairway.

It's just the buildings today are getting more and more complicated. That's why, if you look at a reserve study for an older building, you may have a hundred components.

If you examine a reserve study for a building in Kakaako that is currently under construction, you may find 300 to 500 different components. Consequently, there is a significant distinction.

"Does the new buildings being built now require mandatory fire sprinklers? Or is that an option"

There's no option. All the buildings now are required to have a fire sprinkler system. In the design of all these new buildings, they're designing the fire sprinkler systems into the building, and it's cheaper to put in a sprinkler system for a new building than to do a retrofit. Why? Because when you are building new, you already know that the fire sprinkler piping is going into the common area, hallways and it's going into each unit.

The older building that doesn't have a fire sprinkler system, the building is already built. Guess what? Now you've got to core through walls, core through floors, core through ceilings, concrete, jackhammering. And if the building has drywall then you have to run your sprinklers through there; if your drywall has asbestos or lead paint, now you have a Hazmat issue.

So that could be the reason why the fire stopping and fire sprinkling of older buildings are so expensive because you have all these things to consider and it's very specialized.

You can't just hire a general contractor and say "Go drill holes everywhere, so you can run our piping" I mean, it's almost an art and a science together. Just like doing re-piping of your old cast iron piping in an older building. It's not that easy. You've got Hazmat issues, piping issues and fire stopping.

So, people have to understand the nature of the beast. That's what it is and that's why it costs so much.

“My 25-story building does not have fire sprinklers and does not have an emergency generator. I know our building does not want fire sprinklers, but do we need an emergency generator?”

I would say you need fire sprinklers, but that's not for me to judge. But if you're on the board or you talked to the board, “This building expert guy said that we need fire sprinklers.” And they might say, “Well, okay, but we have no money now, what do we do?”

I always say go up on the life safety. Whatever's the highest bar that we can use for fire/life safety, without concern about the money, that's what I would support.

Regarding the emergency generator, I do not know where your building is located, but I would say that if your building is that tall and you do not have an emergency generator, the question is what happens during a power outage. You do not have elevators that work, lighting that works, or a significant amount of functional items.

How will you get water to your apartment on the 38th floor in a high-rise building? If you do not understand how plumbing works, how does one obtain water? There must be a pump, yes?

There are booster pumps, there are some buildings that are split, you got a low zone and a high-zone pump. When there's a power outage. Guess what? The pumps work on electricity, now none of those pump's work.

So, you're up there with no water. That's why I always say the emergency generator is good.

In a huge building, you wouldn't want to because of the costs have a huge emergency generator where it could power your whole building and water system in case of a power outage. It's too costly.

So, you design one emergency generator that powers one elevator and your emergency lighting, that is enough.

There has to be sacrifices with water and other things. In a power outage, you're not going to have any electricity in your unit per se, but you're going to have your elevator working and your emergency lighting.

That's why it's good practice to know who's in your building and who needs help. In case of a fire, how many people need help. The elderly need to evacuate and they may have limited mobility where they cannot move on their own and someone has to help them.

Likewise, if there's someone who's in the building that is on oxygen and needs oxygen, and that's running on electrical, it's good to know that. Because that person would need help because if the power outage lasts for several days and they don't have a backup system for their oxygen machine, that's not very good either. So just be aware of these things.

“I am going to build a new house next year. Do you know what the cost is to install a fire sprinkler system for a new house?”

For a new house, depending on the square footage and how big the house is, you may be looking at maybe \$15 to \$40,000. If you want to do that, I support that.

In some states on the mainland, they actually have mandatory fire sprinkler requirements for a single-family house. So, we're not there yet in Hawaii, although there's a push because it's a good idea. It's sort of like you have a house and the plumber is running plumbing pipes to your bathroom and your laundry.

Similar to installing plumbing pipes in your bathrooms, laundry room, and kitchen, installing a fire sprinkler involves installing pipes throughout your entire home, including your living room, dining room, great room, bedrooms, and bedroom closets.

The code requires that every open space and enclosed space have a fire sprinkler. You may have a tiny little closet, but it might need a fire sprinkler in there.

So, it all depends, but it's a good time to do it while you're building the house new. To retrofit later is kind of a headache. Then what happens is you have piping that may be exposed and it doesn't look good.

I know some condos where they did a fire sprinkler retrofit and they got piping running in their common area, hallways, on the ceiling penetrating through and then if you go into the unit, you see all these pipes and it looks ugly. It doesn't look nice, but I'm thinking I'd rather have it look like that than not have fire sprinklers at all.

Some people build these little soffits and enclosures and paint it and make it look really nice. You can only go so far because you can't enclose the sprinkler heads. Other buildings have recessed fire heads.

If you look at the entire living room, you don't see sprinkler heads hanging down because it's concealed in the ceiling. If you want to do a design like that, where it doesn't look as bad, talk to your architect and engineer and have it designed.

KEEP SAFE!

BONUS CHAPTERS

BONUS CHAPTER I

Fire Alarm Systems: Ensuring High-Rise Safety

It's essential to address one of the most critical components of fire safety – the Fire Alarm System. In this chapter, we will delve deep into the world of Fire Alarm Systems, exploring when to upgrade them, their lifespan, and why they are of paramount importance for ensuring the safety of high-rise building occupants.

Understanding the Importance of Fire Alarm Systems

Before we dive into the technical details, let's comprehend why Fire Alarm Systems are indispensable in high-rise buildings:

1. Life-Saving Role

Fire Alarm Systems serve as the first line of defense against fires by detecting smoke, heat, or flames early on. They provide occupants with precious time to evacuate safely, reducing the risk of injury or loss of life.

2. Property Protection

In addition to safeguarding lives, Fire Alarm Systems help protect the building and its contents. Early detection can minimize property damage and the financial impact of fires.

3. Legal Compliance

Many jurisdictions require high-rise buildings to have functioning Fire Alarm Systems to meet fire safety codes and regulations. Non-compliance can result in hefty fines and legal consequences.

4. Peace of Mind

Knowing that a reliable Fire Alarm System is in place provides peace of mind for residents, workers, and building owners, fostering a sense of security.

Determining When to Upgrade Your Fire Alarm System

Fire Alarm Systems, like any technology, have a finite lifespan. To ensure they continue to perform optimally, consider the following factors:

1. Age and Technology

Fire Alarm Systems typically have a lifespan of 10-15 years. If your system is approaching this age or relies on outdated technology, it's time to think about an upgrade.

2. Regulatory Changes

Updates in fire safety codes and regulations may necessitate system upgrades to ensure compliance. Staying informed about these changes is crucial.

3. Frequent False Alarms

A system that frequently triggers false alarms can be a sign of malfunctioning components. Frequent service calls may indicate the need for an upgrade.

4. System Expansions

If your high-rise building undergoes renovations or expansions, it's essential to evaluate whether your existing system can accommodate the changes.

5. Regular Maintenance

Regular maintenance and inspections are vital to extending the life of your Fire Alarm System. Be proactive in scheduling routine checks and repairs.

Upgrade Process: Dos and Don'ts

When planning to upgrade your Fire Alarm System, follow these dos and don'ts for a smooth and effective transition:

Dos:

1. **Consult Experts:** Engage certified fire safety professionals to assess your building's specific needs and recommend suitable upgrades.
2. **Budget Wisely:** Allocate sufficient funds for the upgrade, considering both equipment and installation costs.
3. **Notify Occupants:** Keep residents and occupants informed about the upgrade schedule and any temporary disruptions.
4. **Comply with Regulations:** Ensure that your upgraded system meets current fire safety codes and local regulations.

Don'ts:

1. **Cut Corners:** Avoid compromising on quality or skipping essential components to save costs. Safety should always come first.
2. **DIY Installation:** Never attempt to install or upgrade a Fire Alarm System without professional expertise. Improper installations can lead to system failures.
3. **Ignore Maintenance:** Even after an upgrade, regular maintenance is crucial. Neglecting it can lead to system malfunctions.

Fire Alarm Systems are the unsung heroes of high-rise building safety. Understanding when to upgrade them, their lifespan, and the importance they hold can make all the difference in protecting lives and property. By following best practices and staying vigilant, you can ensure that your high-rise building remains a safe and secure environment for all its occupants.

BONUS CHAPTER II

Fire Sprinkler Systems: A Crucial Element in High-Rise Safety

In this bonus chapter, we shift our focus to another pivotal aspect of fire safety in high-rise buildings – using **Fire Sprinkler Systems**. We'll explore the significance of these systems, the key indicators for when an upgrade is necessary, and the essential dos and don'ts during the upgrade process.

1. **Rapid Fire Suppression:** Fire Sprinkler Systems are designed to swiftly suppress fires, limiting their growth and preventing the spread to other areas. This rapid response significantly enhances the chances of controlling a fire before it becomes uncontrollable.

2. **Comprehensive Coverage:** Unlike other fire suppression methods, sprinkler systems cover a wide area, providing a blanket of protection. This ensures that fires in any part of the building are addressed promptly, minimizing damage.
3. **Property Preservation:** Beyond saving lives, Fire Sprinkler Systems contribute to property protection by minimizing fire damage. The quick activation of sprinklers helps reduce financial losses associated with fire-related destruction.
4. **Compliance with Codes:** Many building codes and regulations mandate the installation of Fire Sprinkler Systems in high-rise structures. Adhering to these codes is not only a legal requirement but also a crucial step in ensuring the safety of occupants.

Determining When to Upgrade Your Fire Sprinkler System Similar to Fire Alarm Systems, Fire Sprinkler Systems have a finite lifespan and require regular evaluations. Consider the following factors to determine when an upgrade is necessary:

1. **Age and Condition:** Fire Sprinkler Systems typically last around 20-25 years. If your system is approaching this age or shows signs of deterioration, it's time to consider an upgrade.
2. **Technological Advances:** Advances in fire suppression technology may provide more efficient and effective sprinkler systems. If your current system lags behind in technology, an upgrade could enhance overall performance.
3. **System Obsolescence:** If replacement parts for your existing system are challenging to find due to obsolescence, it's a strong indicator that an upgrade is needed to ensure the availability of replacement components.
4. **Changes in Building Use:** Alterations in building occupancy or use may necessitate adjustments to the sprinkler system. Evaluate whether your current system can adequately meet the demands of the updated building configuration.
5. **Regulatory Updates:** Stay informed about changes in building codes and regulations that may require upgrades to your Fire Sprinkler System. Compliance with the latest standards is crucial for legal and safety reasons.

Upgrade Process: Dos and Don'ts When planning a Fire Sprinkler System upgrade, adhere to these dos and don'ts for a successful and secure transition:

Dos:

1. **Professional Assessment:** Engage qualified fire safety professionals to assess your building's unique needs and recommend appropriate upgrades tailored to your specific requirements.
2. **Thorough Budgeting:** Allocate sufficient funds for the upgrade, encompassing costs for both equipment and installation. Consider long-term benefits and potential cost savings in fire damage.
3. **Occupant Communication:** Keep residents and occupants well-informed about the upgrade schedule, potential disruptions, and safety measures during the process.
4. **Regulatory Compliance:** Ensure that the upgraded system aligns with current building codes and local regulations. Compliance is essential for the safety of occupants and to avoid legal repercussions.

Don'ts:

1. **Compromising Quality:** Avoid compromising on the quality of components or installation to cut costs. The safety of occupants should always take precedence over budget considerations.
2. **Untrained Installation:** Never attempt to install or upgrade a Fire Sprinkler System without professional expertise. Incorrect installations may lead to system malfunctions and compromise overall fire safety.
3. **Neglecting Maintenance:** Even after an upgrade, regular maintenance is paramount. Neglecting routine checks and upkeep can result in system failures when they are needed most.

Fire Sprinkler Systems are indispensable guardians of high-rise building safety. Recognizing the signs for upgrades, understanding their lifespan, and following best practices during the upgrade process are key to maintaining a safe and secure environment for all occupants.

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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.

Sign up for a future webinar or two, or watch a few on demand at askbuildingexpert.now.site