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Learning form Disaster: A Review of Hong Kong's Policy Drive to Prevent Building Collapses and Fires

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ABSTRACT

Hong Kong's crowded city, with its old buildings and many people, has some tough structural and fire safety problems. In 2024, a significant incident happened when an illegal structure fell down at Redhill Peninsula on Hong Kong Island. Luckily, nobody died, but a lot of property was damaged.

Then, in 2025, a terrible fire in Tai Po killed 176 people and got everyone worried again about how safe buildings are from fires. These two significant events were a wake-up call, showing some large weaknesses in how buildings are kept up, problems with illegal construction, and issues with fire safety equipment. This paper looks at the different things that cause buildings to fail and fires to happen in Hong Kong.

This includes old buildings, changes to structures that were not allowed, badly designed drainage, and poor upkeep of fire equipment, and bad renovation work. The paper also looks at what the Hong Kong Government has done to fix these problems, like the Minor Works Control System, the Mandatory Building Inspection Scheme, and new rules from the Fire Services Department.

It talks about how important Registered Inspectors and Registered Professional Engineers are when it comes to making these safety measures work. It also discusses about good inspection methods, paperwork, and doing a good job as a professional. By looking at all this, the hope is to add something to the talks about safety and stopping disasters in cities with lots of people.

Keywords: Building Safety, Fire Safety, Fire Service Installations, Unauthorized Building Structures, Urban Disaster Prevention

INTRODUCTION

Hong Kong is one of the most crowded places on Earth, and it has lots of buildings that are over 30 years old. The way Hong Kong is built, with so many buildings packed together, makes good use of space, but it also means there are tough safety issues that require careful attention and regular checks. In the past, Hong Kong usually only took action on building safety after something bad happened.

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An old tenement building in Ma Tau Wai collapsed in 2011 which caused 4 deaths and 2 injuries. This event was a turning point for building safety rules in Hong Kong. A worker took out a support beam, and the whole building crashed. This showed that there were issues in how small construction jobs were watched over and how building changes were checked. Because of this, the Buildings Department (BD) and Building Authority (BA) came up with two plans: the Minor Works Control System (MWCS) and the Mandatory Building Inspection Scheme (MBIS). These plans were made to give clear advice to workers and building owners, so they could take steps to keep similar disasters from happening again.

Even with these rules, recent events at Redhill Peninsula (Ho, 2024) and Tai Po show that there are still problems. The Redhill Peninsula problem showed how dangerous it is when buildings are put up without permission and without proper planning. The Tai Po fire (Yiu, 2025), which killed 176 people, showed how important it is to have working fire equipment, clear escape routes, and fire safety features that are well-maintained.

In fact, good building and fire safety needs to cover all bases by including checking buildings, using fire safety knowledge, following maintenance steps, and making sure rules are actually followed. Also, qualified people, Registered Inspectors (RIs) and Registered Professional Engineers (RPEs), are very important for finding risks and making sure rules are followed before accidents happen, not just looking into things after something bad has already occurred.

The Multifaceted Problems Affecting Building and Fire Safety

Aging building stock and structural deterioration

A lot of buildings in Hong Kong are around 40 to 50 years old. Many have not been kept up well and are past their expected lifespan. Hong Kong's weather, with its humidity, rain, and salty air, speeds up the decay of building stuff (Fong et al., 2023). One common issue is concrete spalling, where the concrete surface flakes off.

This exposes the steel inside to moisture and air, causing it to rust. Once the steel rusts, it expands, cracking the concrete even more and making the problem worse. This cycle gradually weakens the building's structure.

Columns and beams, which hold up the building, are especially at risk. If the steel inside these concrete parts rusts a lot or breaks, the columns and beams cannot support as much weight. A building might look fine from the outside, but inside, its structural parts could be a lot weaker. This hidden damage is a big safety risk because it can cause sudden failure without warning.

Unauthorized building structures (UBS)

The Redhill Peninsula incident in 2024 really put unapproved building projects in the spotlight. These projects are any construction done without the Building Authority's go-ahead. This can include stuff like adding things to roofs, enclosing balconies, adding canopies or mezzanine floors, and making big changes to how the inside of a building is set up.

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These structures can be really risky because they are usually planned and built without getting proper engineering advice, figuring out how much weight they can handle, or thinking about how they affect the original building.

People build these things for all sorts of reasons, but it is often because they want to get the most out of their space in Hong Kong's small living areas. But, doing that can have big consequences. Unapproved structures can put too much weight on the building's base and other parts, add weight where it should not be, or remove parts that keep the building standing. The Redhill Peninsula collapse showed us that even structures that seem fine for years can suddenly fail when they are pushed too hard or when damage goes unnoticed.

Poor sewage drainage design and maintenance

The 2003 SARS outbreak was a harsh reminder of how bad drainage can impact public health. In Amoy Gardens, contaminated sewage with the SARS virus spread through badly designed drainage, infecting many people and making the outbreak worse. The event showed that building systems can spread diseases if design is bad or upkeep is ignored.

The main issue is that drainage traps dry out, which allows sewer gases and contaminated stuff to enter living spaces. Badly sealed spots, cracked pipes, and not enough venting all add to this. The SARS outbreak showed the health risks, but the problem of old, damaged, or badly kept drainage is still common in Hong Kong's older buildings (Wei et al., 2021). Blockages from trash, roots, or damage can cause backups, overflows, and unhygienic conditions that affect whole buildings.

Inadequate fire service installations (FSIs) maintenance

The terrible fire in Tai Po in 2025, where 176 people died, has made everyone realize how important it is to check the fire safety equipment in Hong Kong's buildings. This equipment includes things that spot fires, warn people, stop flames, and help people get out safely. Things like fire doors, sprinklers, fire hydrants, alarms, emergency lights, and smoke control systems are all a part of it.

Fire doors are really important, but people tend to forget about them. If they are working right, they keep fire and smoke from spreading, which protects escape routes and gives people time to get out. But often, these doors are wedged open because it is easier, or they are broken from use, or changed in ways that make them less fire-resistant. Sometimes the glass in them is broken or replaced with the wrong kind, and the devices that make them close on their own are broken or gone.

Escape routes are also important. Stairways and halls need to be clear and wide enough for people to get out. But these routes often have things stored in them, locked gates, or changes that aren't allowed.

Putting metal gates or doors across stairways, especially if they are locked, can turn a safe way out into a deadly trap. Also, doors to roofs need to be open during emergencies, but they are often locked for security reasons, which goes against fire safety rules.

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Stairway pressure systems (Rusli et al., 2025) are a way to deal with smoke, which is the main cause of death in fires. Research shows that most people die from breathing in smoke, not from the flames. Smoke has poisonous gases and tiny particles that can quickly make people unable to move. If stairways don't have outside windows, smoke can build up and block escape routes.

Stairway pressure systems keep the air pressure in the stairwell higher than in the floors next to it. This stops smoke from getting in and keeps the escape route safe. Smoke removal systems (Zheng & Feng, 2024) also help by taking smoke away from the areas that are on fire, so people can see better and the air is less toxic.

The Fire Services Department (2026) has changed its FS 501/501A forms (Certificate of Completion of Installation of Fire Service Installations and Equipment in New Buildings) to focus more on these smoke control systems because they are so important. But these systems need to be checked, kept up, and tested regularly to make sure they work when they are needed.

This does not always happen. Fire trucks also need to be able to get close to buildings to hook up hoses to fire hydrants. Fireman lifts need to be in good working order so firefighters can get to the upper floors quickly with their equipment. Street fire hydrants need to be close enough to buildings, as said in FSD rules, and they need to be easy to get to and working.

Improper retrofit work and unqualified contractors

It is worrying to see that some building owners in Hong Kong are hiring contractors who aren't registered or qualified to do renovation and alteration work. A recent case in Lohas Park, Tseung Kwan O, shows how risky this can be. To save money, some owners hired a contractor to do some work, but this person was not familiar with the Buildings Ordinance. Because of this, the work did not meet the legal requirements.

Now, the owner is facing charges. This situation shows a problem in the system by putting cost cuts first in building without checking things well can cause big legal problems and safety risks. Cutting corners like that hurts how strong a building is, puts people in danger, and often leads to pricey lawsuits, fines, and a bad reputation. In the end, it costs more than any quick money saved.

The quality of renovation work really matters for things like structural safety and fire protection. For example, welding is often used to connect steel parts and support building services. How well the welding is done affects how strong the connections are.

If the welding is done right, it can reach about 50% of the base metal's strength, which should be enough when combined with safety measures. But, if the welding is bad, or if the materials are faulty, the connections could fail under much smaller loads than they are designed for. Metal frames and other structures sometimes collapse because of bad welding.

Secondary structural elements and falling objects hazards

Beyond primary structural elements, buildings contain numerous secondary components that can pose serious safety risks if not properly designed, installed, and maintained. Handrails in commercial complexes and

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staircases must be securely designed and maintained in good condition. During festive events, commercial atria often attract large crowds, with people leaning on upper-level handrails to view activities below. The concentrated loading from many individuals simultaneously leaning on a handrail can exceed design capacities, potentially causing collapse with people falling to lower levels. This scenario that has resulted in major fatal accidents internationally.

External building elements, including advertisement signs, wall tiles, amenities features, canopies, and eaves, are subject to weathering and deterioration that can lead to components loosening and falling onto streets below. The consequences of falling objects in Hong Kong's dense urban environment can be catastrophic, given the constant pedestrian traffic below buildings. Support structures for these elements must be adequate and strong, securely linked to the building's reinforcement beams, columns, and floor slabs. Cantilevered elements are particularly critical; the ends of cantilever beams extended from buildings must be properly integrated to reinforce support strength and prevent progressive collapse.

Windows represent another falling object hazard, with incidents occurring with sufficient frequency that the Buildings Department (2012a) introduced the Mandatory Window Inspection Scheme (MWIS). However, RIs must recognize that window safety cannot be considered solely during scheduled MWIS inspections; window conditions must be assessed continuously as part of overall building safety evaluations.

Buildings have more than just the main structural parts. Other things can be dangerous if they are not designed, put in, and kept up well. For example, handrails in stores and stairways need to be strong and in good shape. Lots of people gather in malls during events. They often lean on the handrails on upper floors to watch what is happening below. If too many people lean on a handrail at the same time, it can break. This could make people fall to the floor below. Sadly, this has happened and caused deaths in other countries.

Things on the outside of buildings can also be risky. Signs, tiles, and other features can wear down over time. They might come loose and fall onto the street. In a crowded place like Hong Kong, this can be really bad because there are always people walking below. The things that hold these outside parts up need to be strong and well connected to the building. Things that stick out, like balconies, are especially important. The ends of these sticking-out parts need to be built well so they do not fall down. Windows are another problem. They fall often enough that the city has a mandatory window inspection scheme for them. But inspectors need to keep an eye on windows all the time, not just during those inspections. They should check windows as part of their regular safety checks of the whole building.

Hong Kong Government's Preventive Policy Framework

The Minor Works Control System

After the to Kwa Wan collapse, the Minor Works Control System (MWCS) (Buildings Department, 2024) was created. It is a way to manage building projects that are not huge, but still have safety issues. The MWCS divides smaller projects into three groups, each with about 70 items (Buildings Department, 2021), making a total of 187 different kinds of work.

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This includes things like putting in window frames or building supports for solar panels. For each group of smaller projects, the MWCS Ordinance Appendices give specific rules about design, materials, how the work is done, and sizes, if needed. For instance, barrier handrails have to be a certain height. When putting solar panels on roofs, you have to think about how tall the panels are, how they are attached to concrete blocks, how much they weigh overall, and if the roof can actually hold that much weight, according to the structural drawings in the BD's Bravo system (Buildings Department, 2023).

The MWCS also sets up a system for registering contractors who can do smaller projects. There are registered Minor Works Contractors and those who are not registered. It is important to know the difference because registered contractors should know the rules and be able to do the work safely and legally.

Mandatory Building Inspection Scheme

The Mandatory Building Inspection Scheme (MBIS) (Building Department, 2012) says that if you own a building that's 30 years old or more, you need to get a Registered Inspector to check out the common areas, outside walls, and important structural parts. The Building Department (BD) chooses these inspectors. They have to give detailed reports to both you and the BD, suggesting fixes to keep the building safe. The following items are the inspectors need to look at.

(a) Unauthorized building structures -- Inspectors need to find and note any structures that were not approved, check their condition, and see if they are risky. If one looks like it is about to fall, the inspector needs to tell the BD right away. The Redhill Peninsula collapse shows why this is so important. If an inspector had spotted the problems earlier, maybe it could have been stopped.

(b) Structural safety -- Inspectors will check things like columns, beams, floors, and walls that hold up the building. They will look for things like concrete falling apart, cracks, rust, or bending. If the structure is really weak, they might suggest patching things up or replacing steel. Or, if it is really bad, they might add extra support with steel beams connected to the building's frame.

(c) Drainage conditions -- Inspectors will look at the sewage pipes for cracks or blockages. Since SARS and COVID (Centre for Health Protection, 2026), keeping drainage safe is a big deal. The BD even has money to help owners fix bad drainage in old buildings. Inspectors need to use special cameras on wheels to see inside underground pipes because you cannot see everything just by looking.

(d) Fire service installations -- Inspectors will check fire safety stuff, like fire doors, escape routes, and if the hallways and stairs are wide enough. They will also see if staircases are smoky, checking if they have windows or are closed off. Closed staircases are dangerous in a fire. If there is a risk, they might suggest adding systems to keep the stairs clear of smoke.

Mandatory Window Inspection Scheme

Hong Kong's Mandatory Window Inspection Scheme (MWIS) is an important law because falling windows are a real danger in the city. Because Hong Kong has so many tall buildings packed closely together, even a

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small problem with a window high up can be very dangerous for people below. That is why it is so important to take steps to prevent windows from falling. The MWIS says that if your building is ten years old or older, you must hire someone qualified to check all the windows carefully. If they find any problems, they also need to watch over the repairs.

But the plan works well only if people do more than just follow the rules. Inspections need to be part of a bigger plan to keep buildings safe. As this paper says, Registered Inspectors (RIs) have a big job. They cannot just check off items on a list. They need to think about how window safety fits into the whole building's structure. They should see if problems like crumbling concrete, rust, or bad framework in one place might mean there are risks in other parts of the building too.

Thinking about the whole building is key to doing a good job. If an RI inspects a building and says the windows are fine, but then a window falls because they missed something obvious, that RI is responsible. They didn't do their job right, and they could be sued, punished by regulators, and lose their good name. So, the MWIS is not just about following rules. It is a constant duty for professionals to be watchful, check everything carefully, and always put public safety first.

Enhanced fire safety requirements

After the Tai Po fire and other events, the Fire Services Department has made its rules and checks tougher. The updated FS 501/501A forms now focus more on key fire safety things:

(a) Staircase pressure and smoke removal -- These are now seen as super important for keeping escape routes safe in buildings where staircases do not have outside air. The forms want proof that these systems work right, like checking pressure differences, airflow, and if they turn on by themselves during tests.

(b) Fire door condition -- Checks must confirm fire doors are not falling apart or broken. Glass panels need to be in good shape and rated correctly. Doors should stay closed and have working self-closing tools.

(c) Clear escape paths -- Staircases and escape routes need to be clear. Metal gates or doors on these routes shouldn't be locked in a way that stops people from getting out. Roof exit doors must be unlocked and easy to get to when the building is in use. Refuge floor doors also need to be easy to get to.

(d) Firefighter access -- Parking spots for fire trucks must be open and easy to get to. This way, hoses can quickly connect to fire service inlets and sprinkler inlets from street hydrants. Fireman lifts need to be confirmed as working well and safely.

(e) Street fire hydrants -- Street hydrants need to be close enough to buildings so fire trucks can get water without using super long hoses.

To make buildings safer from fire, we need to focus on creating fire-stopping systems that do not cost too much, using smart designs, figuring out what new building materials do in a fire, improving our building codes to focus on how a building will actually behave in a fire, and understanding the risks from wildfires (Kodur,

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Kumar & Rafi, 2020). Doing research and training people in these areas will really help us build stronger, safer buildings and make sure that people know how to handle new fire dangers.

Barrier-free access considerations

While the primary responsibilities of Registered Inspectors (RIs) center on structural integrity and immediate safety hazards, a truly comprehensive building safety assessment cannot afford to overlook accessibility considerations. The Barrier Free Access (Hong Kong Housing Authority, 2026) requirements therefore merit significant attention within the broader inspection framework. Although RIs are not directly tasked with enforcing every nuance of accessibility legislation, their advisory role positions them uniquely to champion inclusive safety.

When RIs conduct their thorough evaluations, they are ideally placed to identify deficiencies in accessible routes and make informed recommendations to building owners. For instance, proposing the installation of properly graded ramps for wheelchair users to access and depart from buildings is a tangible contribution that transcends mere regulatory compliance. Such recommendations address a critical gap in traditional safety planning, which often focuses on able-bodied evacuation.

The concept of "inclusive safety" is paramount here. In the event of a fire, structural collapse, or other emergency, the ability to evacuate quickly can mean the difference between life and death. For individuals with mobility impairments, a single step or a lack of a ramp can become an insurmountable barrier, trapping them in a dangerous environment. By integrating barrier free access principles into their assessments, RIs help ensure that emergency egress strategies account for all occupants, not just the majority. This proactive approach fosters a built environment that is not only safer but also more equitable, fulfilling a professional and ethical duty to protect every individual within a building's premises. Ultimately, such foresight enhances the building's resilience and the community's overall safety.

Financial assistance and support mechanisms

The Hong Kong Government knows it is tough for owners to pay for building safety upgrades, especially in older buildings with lots of residents. That is why they have set up some financial help programs. It shows they get that keeping people safe and taking care of property go hand in hand. Without this help, the cost could stop people from getting important repairs done.

After health scares like SARS and COVID-19, we all saw how important good building stuff is. Bad drainage in old buildings can spread diseases, which is a big worry. So, the Buildings Department (BD) is giving money to owners to fix up their drainage. This helps owners who might not be able to afford big repairs right away and keeps everyone else safe from germs. These programs get that building safety is everyone's problem, not just the owner's. By helping with the money, the government makes it easier for people to meet safety rules, keeps the city looking good, and gets people to fix things before they get bad. In the end, this makes the city safer and prevents delays on important improvements because of money issues. It protects people and the city we all share.

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The Critical Role of Registered Inspectors and Professional Engineers

Professional competence and responsibilities

In Hong Kong's building safety system, Registered Inspectors and Registered Professional Engineers are key. How good they are, how hard they work, and their good judgment directly impact how well inspections work and how safe buildings are. When the Buildings Department chooses RIs to check buildings, it expects them to do a complete job, spotting possible dangers before anything bad happens.

Being professional means more than just filling out forms. RIs need to get how building safety works, know what unusual warning signs look like, and decide if what they see needs fixing right away or can wait for planned repairs. Figuring out if something is just a small issue or a big danger that is about to happen takes experience, know-how, and guts to make tough decisions.

Investment in proper inspection tools

To do a thing the right way, you need the right instrument in your toolbox. Here are a few key pieces of instrument that can help you do excellent work:

(a) Telescopic cameras -- When checking the outside of tall buildings, cameras with strong zoom let you see things up close that you normally couldn't from the ground. Using phone cameras is not good enough because they do not have good lenses for things far away.

(b) CCTV robotic cameras -- For checking pipes underground, these cameras can drive around and show you what is going on. You can spot things like cracks, blockages, roots, and loose joints. Inspection companies can buy this instrument themselves or hire someone who specializes in CCTV surveys.

(c) Ultrasonic testing equipment -- To see how good the welds are on metal structures, these instrument can check for problems without breaking anything. They can find issues like weak spots, holes, or cracks. This gives you solid proof of how good the welding is, which you cannot get from just looking at it.

Buying these instrument shows you are serious about doing a great job. Sure, it costs money, but you can split the cost with clients. For example, you could offer to split the cost 50/50 for instrument needed for their project. If clients do not want to share the cost, you might have to turn down the job because you cannot do a good inspection without the right instrument. As the saying goes, a good name is better than riches.

Documentation and evidence preservation

After the Tai Po fire and the Redhill Peninsula collapse, keeping good records of inspections is super important. If there is a fatal accident or something serious, government investigators will check what inspections were done, what problems were found, and what was advised or done about them. If you are an RI or RPE and you have detailed records that show you did what you needed to do with the right tools and good judgment, you are a lot less likely to get sued. The tower crane collapse and the mirror concert metal frame collapse mentioned in the paper really show why this matters. In those cases, the RPE did not have any records of inspections or

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checks. Because of this, the person in charge ran away from Hong Kong and ruined their career to avoid being sued by the government. This whole mess could have been avoided if they had kept good records of inspections, test results, and their professional opinions.

Therefore, the records should include:

(a) Detailed notes about what you saw during inspections

(b) Photos and videos of the problems you found

(c) Records of test results from tools, like ultrasonic weld testing and pressure measurements

(d) Emails or letters to building owners about what you found and what you suggested

(e) Records of when you told the Buildings Department (BD) about immediate dangers

(f) Proof that you followed up to make sure any fixes were actually done right

Comprehensive risk assessment

RIs need to do detailed risk checks that look at all parts of building safety at the same time. The MBIS check items give a guide, but good people do not just stop there. They spot risks that link together. The following are some examples:

(a) When checking the structure, think about the current state, but also if any changes have messed with how loads are spread and if the structure is still strong.

(b) When looking at fire safety (Meacham, 2023), think about how the building is laid out, the number of people inside, and how the fire systems all work together for overall safety.

(c) When checking the drainage, look at how well it works now and if it might get damaged or blocked in the future.

(d) When checking outside parts of the building, see if anything is loose and could fall off, and also if anything is slowly getting worse and could fail later on.

RECOMMENDATIONS AND REMEDIAL ACTIONS

If an inspection finds problems, Registered Inspectors (RIs) need to give advice that is easy to understand, so building owners know exactly what to do. This advice needs to put safety first and make fixing things as easy as possible.

First of all, the most dangerous stuff needs to be dealt with first. For example, if concrete is breaking off and could fall, or there are big cracks in the building's structure, these things need immediate attention. For each problem, RIs should explain the exact technical steps to take to fix it. They should base their guidance on rules

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and regulations like the Building (Construction) Regulations. Being specific makes sure the fixes are done right and meet requirements.

RIs should also tell owners what kind of contractor they need. For smaller jobs, they might suggest using registered Minor Works Contractors. This helps owners find qualified people who follow the law, and avoid issues with unlicensed workers. It is also important to give owners reasonable timeframes for completing the work. This means balancing how quickly the work needs to be done with the time it takes to plan and get supplies. If possible, estimates for the work helps owners plan their spending and avoid unexpected costs.

For big structural problems, like weakening supports, fixing things gets more involved. When the structure needs reinforcement, RIs might suggest adding support inside or outside the building, like I-beams. These steel pieces, used as beams or columns, need to be connected to the existing structure with metal brackets and elbows. These types of fixes are not basic repairs. They need to be designed by a professional engineer to make sure the load is properly distributed and that the new support works with the old structure, keeping it safe and stable for the long haul.

Addressing free-standing structures

One thing this paper talks about is how unstable structures that stand alone can be, mostly because they do not have other buildings next to them to keep them steady.

To make sure they stay up, these structures need to be hooked up to the main building's frame, especially the columns and beams. Just attaching them to the outside walls is not enough since things like plaster or cladding are not strong enough to give real support and can break if there's too much weight.

If there are not any buildings around to connect to, you need other plans. One idea is to link the structures together as a group. This helps because it spreads out the force from wind and other things, so if one part fails, the whole thing does not fall apart.

There are also some regular engineering tricks you can use to keep things steady. For example, you can use metal supports that are stuck to the ground, add diagonal braces to stop sideways movement, or use steel wires to tie the structure to the ground. Doing these things helps make sure the structure doesn't tip over and stays safe for people.

Technical Considerations for Specific Building Elements

Roof structures and safety barriers

Roofs often have stuff on them, like water tanks, equipment rooms, communication devices, and more and more, solar panels. To get to these things, you usually need ladders. These ladders should have lockable metal covers at the bottom to keep people from climbing up without permission.

Roofs must have safety railings around the edges, so people do not get too close to the edge and fall off. Something that has happened to tourists near cliffs when they get too close for a better view.

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The height of these safety barriers and railings is stated in MWCS Ordinance Appendices, and Registered Inspectors (RIs) need to make sure they meet these standards. For solar panel setups, which are getting really common, RIs need to check:

(a) How high the solar panels are above the roof.

(b) How they are attached (like with concrete blocks or frames).

(c) The total weight of the setup.

(d) If the total weight goes over the limit that the roof can hold, according to the building plans.

You can usually find the building plans for older buildings on the BD's Bravo system, which is helpful for figuring out how much weight the roof can take.

Welded connections

Welded spots really matter for how safe a structure is, especially when it comes to metal frames, supports, and things attached to them. If you weld things well, those spots can hold about half the strength of the metal they are connected to. Factor in some safety when you are planning things out, and you have got connections that can handle the weight they are supposed to. But if the welding is bad, connections can fail way before they should.

Mechanical engineers need the right tools to check how good a weld is. Ultrasonic testing is a way to check welds without breaking them. It can spot problems inside the weld that you cannot see just by looking. Keeping records of these tests is super important to show that the welds are up to snuff.

Drainage systems post-SARS and COVID

The SARS outbreak at Amoy Gardens really showed how drainage system failures can impact public health. Because of that, and after the COVID-19 pandemic, people are paying closer attention to how well drainage systems are working. When Registered Inspectors check out older buildings, they should:

(a) Look at drainage pipes they can easily reach for cracks, leaks, or damage.

(b) Use CCTV cameras to check underground pipes they can't see directly.

(c) Make sure drainage connections are properly trapped and sealed.

(d) Check that vent pipes aren't blocked and are working correctly.

(e) Figure out if traps in drains that aren't used often might dry out.

(f) Suggest fixes if they find any problems.

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The Building Department's money to help improve drainage in older buildings shows they know how important this stuff is for public health. This money helps owners fix problems that are found.

Means of escape and refuge

When planning how people will escape, think about the whole process, from when they first leave their rooms until they are safely outside. Key considerations include:

(a) Make sure escape routes are wide enough for the number of people expected.

(b) Keep the distance people must travel to reach exits within the allowed limits.

(c) Protect escape routes from fire and smoke.

(d) Keep escape routes clear of obstacles.

(e) If there are refuge floors in tall buildings, make sure people can get to them.

(f) Have alternate escape routes ready, just in case one is blocked by fire.

It is crucial to regularly check that escape routes are clear and that doors along these routes (including exit doors to roofs and entrance doors to refuge floors) are not locked when the building is in use.

CONCLUSION

The 2024 Redhill Peninsula unauthorized building structures collapse and the 2025 Tai Po fire show us we cannot just assume buildings and fire safety are okay. These events, along with past disasters like the To Kwa Wan collapse and the SARS outbreak at Amoy Gardens, have really shaped how Hong Kong now regulates building safety.

The Hong Kong Government has reacted with different policies that have changed over time. The Minor Works Control System controls smaller building projects in an organized way. The Mandatory Building Inspection Scheme makes sure older buildings are checked by pros regularly. The Mandatory Window Inspection Scheme deals with the specific problem of windows falling. Better Fire Services Department rules mean tougher fire safety steps. Plans for money help owners afford needed fixes.

These actions mainly depend on Registered Inspectors and Registered Professional Engineers. They do checks, find risks, and suggest fixes. How well they do their jobs, how careful they are, and how honest they are directly affects if safety problems are caught before accidents happen. Buying the right checkup tools (like cameras that zoom, CCTV robots, and sound testing gear) is key for good checks. Careful records prove they did their job well and protect them if something happens later.

This paper stresses a simple idea about stopping disasters: You cannot predict accidents and fires. You can, though, find the risks and lessen them with regular checks and quick fixes. Every bad event should lead to an investigation that not only writes down what happened but asks why it happened. This lets government groups

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create plans to stop it from happening again. This way of learning from bad things to avoid future ones is the best way to handle public safety.

For building owners, people living or working in buildings, and the whole community, the message is clear: keeping buildings safe needs constant focus, money, and expert help. Waiting for the next collapse or fire costs too much in lives and money. Hong Kong is packed with buildings, so there's no room for mistakes; safety must be an active thing, not something you just guess is there.

Going forward, we need to keep making rules better, keep putting money into checks and fixes, strongly enforce the rules, and have pros who are committed to doing great work. As this paper ends, a good name is worth more than money.

For those who work on building safety, this means they must find risks, suggest needed actions, and write things down carefully. This makes sure buildings are safer each time they're checked and that people can live and work without worry in those buildings.

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