Fire Escapes and Firefighters

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A glance into the back yards and side alleys of this nation will reveal many rusted, corroded, and broken fire escapes. The fire escapes on most old buildings are very different from the sturdy, freshly painted fire escapes found on the drill towers of fire training centers. Some have been attached to walls of buildings for half a century or more and have become extremely dangerous to use because of neglect or improper maintenance.

In the suburbs, fire escapes often serve attics of two-and-a-half-story houses. When the attic is occupied by a family member or a boarder, a fire escape is often attached on the outside of the structure near an attic window, providing a second exit from the attic. Multi-story public schools, commercial buildings, and apartment houses are also served by fire escapes. In some neighborhoods, as a fire escape becomes more susceptible to corrosion and collapse because of age and neglect, the chances of a firefighter having to climb it during a fire become greater, for the threat of fire in the building itself becomes greater.

Firefighters use fire escapes for many purposes: to gain access to a burning apartment in order to rescue and remove trapped or unconscious people, to force entry through windows at a minor fire, to advance a hose line into a burning apartment, to ventilate windows, and to operate hand lines from exposed buildings at major fires. There are many types, designs, and variations of metal fire escapes; however, most can be grouped into one of three classifications: exterior screened stairways, party balconies, and standard fire escapes with mechanical street ladders.

Exterior Screened Stairway

The safest type of fire escape, the exterior screened stairway, is enclosed by a high metal screen or railing, and extends from the top floor of the building to the street by way of a permanent, stationary metal stair. Unlike other fire escapes, the exterior screened stairway has no sliding "drop" ladder or movable counterbalance stairway from the lowest balcony to the street. It is like an interior stairway in that the rise of the step is similar, it is wide enough for two people to descend side by side, and it includes a handrail

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Despite these positive features, the exterior screened stairway still presents a hazard to firefighters. It is constructed of metal and becomes rusted by exposure to the elements. Weakened by corrosion, its steps can collapse suddenly under the weight of a firefighter. A

New York City firefighter fell while climbing an exterior screened stairway. The firefighter suffered fractured pelvic bones, a broken elbow, a ruptured spleen, and a torn bladder. He spent four months in the hospital and was permanently disabled.

Firefighters use fire escapes to gain access to upper floors more often than occupants of buildings use them to flee fires. Consequently, firefighters are injured by fire escape collapses more often than building occupants. The cause of most of these injuries is step failure.

Corrosion causes the failure of the connection between the step and the stringer to which it is attached. This small space between the step and the stringer, where the connecting bolt or weld is located, is inaccessible to normal maintenance procedures like scraping and painting. Even a visual inspection will not detect this weakness. When a firefighter runs up the steps, the impact of his body weight pounding on a corroded metal step can cause the step to collapse suddenly. To reduce the chances of this happening, firefighters should climb the steps smoothly and not stamp their feet down on the tread; continuously grip some portion of the fire escape railing; place one foot on the step above and apply pressure to the step first, before putting his full weight upon it; and place you feet close to the side of the step. The last procedure causes less deflection of the fire escape step, thus reducing the stress on the connection between the tread and the stringer.

Party Balcony Fire Escape

Unlike the exterior screened stairway or the standard fire escape, the party balcony fire escape has no stairway or ladder connecting intermediate balconies. There is no access to the balconies above or below, or to the street. The party balcony is strictly a horizontal emergency exit, with an exit pathway afforded through the adjoining occupancy. A person fleeing a fire opens a door or window, enters the outside party balcony, walks several feet to the adjoining occupancy, and enters it through a door or window. The real protection provided by a party balcony is the unpierced fire division between the two adjoining occupancies. Formerly constructed of metal, the party balcony is made of wood or concrete.

The hazard of the party balcony is collapse from overloading or failure of the supports fastening the balcony to the outside of the building. Because there are no vertical stairways between party balconies-and since most people escaping a fire do not go to the adjoining occupancies-party balcony fire escapes become quickly overcrowded during a fire. The weight of several people can exceed the load-bearing capacity of a new balcony and cause a corroded old balcony to collapse.

The most tragic incident involving a party balcony fire escape occurred during a fire in an old tenement, a metal party balcony fire escape in the rear of the structure collapsed, and a young mother and her infant daughter fell to their deaths.

When arriving at a fire where people have taken refuge on any type of fire escape, firefighters should act immediately to remove them from these old, rusted, metal structures. If party balconies are involved, firefighters should use portable ladders or aerials, taking special care not to strike the weakened fire escape with excessive force when placing the tip of the ladder on the fire escape railing. If possible, the ladder should be leaned against the building next to the fire escape. In all cases, firefighters should help the victims down.

Standard Fire Escape

The most common type of fire escape found on residential buildings, the standard fire escape is a series of metal balconies interconnected by narrow metal ladders. The top balcony

may have a gooseneck ladder leading to the roof, and the lowest balcony will have a sliding drop ladder or a counterbalance stairway providing access to street level. The ladder on this fire escape is much more difficult to climb than the stair of an exterior screened stairway, as the angle of the ladder is very steep (sometimes as much as 60 or 75 degrees). The ladder step tread is very narrow and the step rise is very high. Also, only one thin bar may be available as a handrail.

When firefighters see a young child or an elderly person standing out on a fire escape, they should consider it a life hazard and immediately remove the individual. The victim should be brought through the window of a safe apartment, below the fire, and taken down the interior stairway. This procedure is safer than walking down the entire fire escape. If a fire escape is used, a step might collapse or the person might lose his balance because of the fire escape's steep angle or unusually small steps.

Step collapse is the most frequent cause of injury to firefighters using standard fire escapes, but firefighters have also been seriously injured when activating the drop ladder or counterbalance stairway, which can collapse or fall apart when operated. A sliding drop ladder is held in place on the lowest balcony of a standard fire escape by a pendulum hook. The hook holding the ladder in place is released when a firefighter standing in the street or yard places the hook of his pike pole beneath the bottom rung of the drop ladder and raises it several inches. The pendulum hook swings away, and the weight of the ladder is transferred to the firefighter's pike pole. The ladder drops straight down as the firefighter quickly removes the hook end of the pike pole from beneath the rung; however, if the drop ladder is not encased in its tracks or guides when it is released, it can fall away from the fire escape and strike the firefighter operating it. For this reason, a firefighter lowering a drop ladder should always stand beneath the fire escape. If the drop ladder falls out of its track, the firefighter will be protected.

Counterbalance stairways on the standard fire escape are also extremely dangerous to operate. Some of these heavy metal structures have not been tested or operated for a quarter of a century and can collapse upon activation.

Supported on a pivot, counterbalance stairways are balanced in a horizontal position by heavy cast-iron counterbalancing weights. Several hundred pounds of metal are either attached to one end of the counterbalance stairway or held up by a steel cable against the side of the building. To activate a counterbalance stairway, a simple manual bar that prevents the ladder from descending is moved out from beneath the counterbalance stairway. A firefighter with a pike pole can do this from street level. The end of the stairway can then be lowered to the street by the pike pole or by the weight of a person walking out on it. Sometimes, however, the sudden impact of the counterbalance stairway striking the ground can cause the entire metal stairway to collapse; the heavy, suspended metal weights can fall off; the cable holding the weights can snap and become a deadly whip; or the entire pulley assembly through which the cable moves can drop into the street. When encountering people awaiting rescue on the lowest balcony of a standard fire escape with a counterbalance stairway, firefighters should use a fire department ground ladder instead of the counterbalance stairs. It is safer for everyone involved.

In some unusual cases, safe operating procedures cannot overcome the hazards presented by fire escapes. In Newark, New Jersey, for example, a firefighter venting windows from the top landing of a three-story, wood frame residence fell to his death when the entire fire escape pulled away from the building and collapsed into the rear yard. The bolts fastening the fire escape to the inside of the building were missing, and the weight of the firefighter caused the fire escape to separate from the building wall.

Lessons Learned

A firefighter cannot prevent a major collapse of a fire escape, such as balcony failure or the entire fire escape's pulling away from the building, but a firefighter can minimize his chances of suffering serious injury from a sudden step collapse or a fall by taking the following precautions.

1. When climbing a fire escape, a firefighter should place one foot on the step above and apply pressure to that step first, before putting full weight upon it.

2. Firefighters should remember that a missing or broken step serves as a warning: A fire escape with one defective step is likely to have another one

3. When climbing a weakened fire escape ladder or stair, a firefighter should place one foot near the outer side of the step, where it meets the stringer. This procedure causes less deflection of the step and reduces the amount of stress caused by the firefighter's weight.

4. When on a fire escape balcony preparing to advance a hose line into a flaming window, a firefighter should not lean against the enclosing rail before testing it but should first apply outward pressure to it with a hand.

5. A firefighter should test the vertical ladder (gooseneck) leading from a fire escape balcony to the roof before ascending or descending it. The firefighter should try to pull it out from the wall to which it is attached.

6. If a firefighter has any uncertainty about a stair or a sliding drop ladder use a fire department ground ladder. The extra time required to obtain and place the ladder is outweighed by the dependability and safety of the fire department equipment. Veteran firefighters will attest that it is much safer to climb a fire department ladder than a fire escape.

7. Before using a pike pole from the ground to activate a sliding drop ladder, a firefighter should stand beneath the fire escape balcony. A firefighter will not be struck by the ladder if it falls outward.

8. Firefighters should never stand beneath a counterbalance stairway or its cable, pulley wheel, or heavy metal balancing weights.

9. When descending a weakened standard fire escape ladder, a firefighter should face the ladder and hold on to the guide rail. If a step suddenly fails, The firefighter will fall into the ladder, minimizing the risk of losing his balance and tumbling off the balcony.

10. When climbing up or down a fire escape, a firefighter should keep one hand free to grip continuously some portion of the fire escape. To do this, officers should attach shoulder

straps to their hand lights, so these can be carried in sling fashion. Engine company firefighters stretching hose up a fire escape should support the hose line with a shoulder or one hand. Ladder company firefighters should interlock their axes and halligan tools and carry them in one hand.

Questions for Fire Escape Newsletter:

1. Which one is not a firefighter use of fire escapes?

A. Advance an attack hose line

B. Platform to vent windows

C. Avenue for search and rescue

D. Platform to talk to the chief at command post

Answer_____

2. **True or False:** When placing an aerial ladder at a fire escape try to place tip against building instead of rusted fire escape railing.

Answer_____

3. Which one is not a common type of fire escape?

A. The party balcony

B. The exterior screened stair

C. The chute type fire escape

D. The standard fire escape

Answer_____

4. **True or false:** The original purpose of a fire escape is to provide a secondary exit for the occupants of a building

Answer_____

5. **Fill in the answer:** The real protection of a _____ fire escape is the unpierced fire division between the two adjoining occupancies.

A. exterior screened stair
B. The party balcony
C. The standard fire escape

Answer_____

Answers: 1.D; 2.T; 3.C; 4.T; 5. B

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