

Fire Safety Considerations in Historic Buildings

IN THE LATE 19TH CENTURY, in reaction to decades of catastrophic fires that had raged across the nation, including Portland's Great Fire of 1866, the idea of "fireproof construction" was introduced. Today, homeowners, investors, building managers and tenants must be conscious of fire prevention and fire safety, especially when working or residing in older or historic buildings.

Brick, stone, slate, plaster, wrought iron, cast iron, and sheet metal, glass, and, after 1900, concrete were popularly considered "fireproof materials." "Fireproof construction," a myth that still persists, provided false assurances in advertising for new hotels, theaters, and places of public assembly. Advances in fire engineering over the past century have proven that there are really no "fireproof" structures, and that fires can feed on the flammable contents of any building. Still, many building materials do offer varying degrees of "fire resistance," and steps can be taken to lessen the probability of a fire.

Property owners should invest in a Fire Safety Assessment, the first step in creating a Fire Response Plan. Confer with your local fire department and request a building inspection. For major commercial blocks, consult with a state-licensed professional fire engineer.

There are three basic concepts of fire safety management in historic buildings:

- Fire Prevention (preventing ignition)
- Passive Fire Protection (construction type or building classification)
- Active Fire Prevention measures (detection and suppression)

Fire Prevention

Recognize most common sources of accidental fires:

- Smoking
- Candles
- Space heaters
- Appliances / Extension cords
- Solid fuel heating devices
- Unlined chimneys



A recent fire at 416-420 Fore Street, in Portland's Old Port, was caused by an improperly installed hot water heater.

- Electrical service malfunction

If you are rehabilitating an older or historic property of any size, insist that your contractor first provide you with a Checklist for Fire Safety that covers risk evaluation of all of the activities, procedures and locations related to the work. This should precede the more formal Fire Response Plan. **Construction-related fires most frequently begin as a result of:**

- Demolition and construction practices involving cutting torches
- Absence of fire watch personnel
- Temporary oil-fired or LP gas heating equipment
- Smoking outside of designated safety areas
- Construction waste and flammable liquids management
- Paint stripping trim and clapboards using open-flame tools (Never permit open flame tools.)
- Dust collection bags igniting from table saws, floor sanders; dull blade friction igniting sawdust/shavings
- Spontaneous combustion from oil-soaked or solvent-saturated rags from re-finishing - rags should be stored only in approved, sealed metal containers

Fire Protection

In our region, older and historic buildings erected before 1940 are classified in several construction classes. Owners of properties must understand both the occupancy classification and construction class of their building as well as any applicable contemporary building, life safety, and fire codes requirements. Building height, egress, fire barriers, fire detection and alarm systems, and fire suppression can be complicated aspects of owning commercial property. Owners should rely on advice from their local fire department, building code inspector, and architect or fire engineering professional when making improvements or adding fire safety features. **Passive Fire Protection measures that can be introduced during rehabilitation include:**

▪ Fire-stops – essential in balloon-frame construction ("three deckers")

▪ Fire separation – (floor plane) barriers between stories

▪ Maintaining plaster walls/ceilings; double-layer gypsum board overlay in corridors

▪ Lining chimneys – maintaining masonry joints

▪ Intumescent paints – applied in egress corridors; fire doors; windows and trim

▪ Endothermic coatings – covering exposed iron and steel structural members

▪ Fire-retardant treatments – applied to structural lumber, wooden shingles

▪ Arc Fault Circuit Interrupters (AFCI) and Ground Fault Circuit Interrupters (GFCI)

Active Fire Suppression

- Fire/smoke detection and alarm systems
- Automatic sprinklers; deluge systems for doorways; windows
- Pressurized mist-type sprinklers; inert gas systems
- Fire-rated enclosures – historic stairs used for egress
- Smoke control systems ■



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