

Avoiding Major Fire Losses at Museums and Cultural Institutions

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Museum Fires

- Harm & damage to:
 - Life
 - Property
 - History
 - Culture
 - Research



Smithsonian Castle Fire of 1865

PLATE 46



Burning of the Smithsonian Institution, January 24, 1865. From a contemporary sketch in *Harper's Weekly*



Recent Museum Fires - Butantan Institute

- Herpetological Collection
 - 77,000 snakes
 - 450,000 spiders & scorpions
- Most important type collections of Brazilian snakes
- 80% of collections destroyed
- No sprinklers or fire alarm



Recent Museum Fires - New Delhi Museum of Natural History



Recent Museum Fires - Museu Nacional, Brazil



Recent Museum Fires - Notre Dame



Recent Museum Fires - Notre Dame



This Will Never Happen To Us...Right?

- 67 museum fires a year between 2007-2011
- Easy to ignore because of everyday hazards
- Reasons museum fires can become catastrophic
 - Absence of fire sprinklers or other suppression
 - A delay in fire discovery
 - Lack of compartmentation of a building
 - Combustibility of collections



What Can Be Done?

- Safety starts with you
- Leadership commitment
- Safety committee
- NFPA 909 (Code for the Protection of Cultural Resource Properties)
- Fire protection program



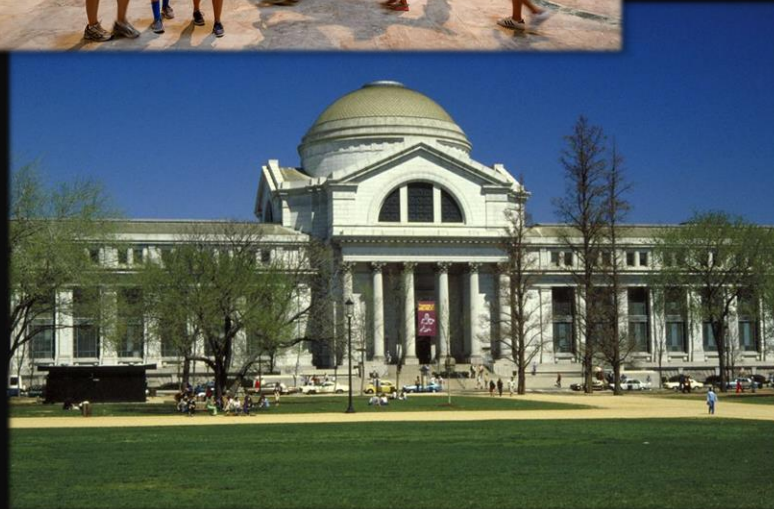
Fire Protection Program/Goals

Building Codes:

- Provide the BARE MINIMUM of life safety for occupants and first responders
- DO NOT provide for protection of collections
- DO NOT provide for continued operations



Fire Protection Program/Goals



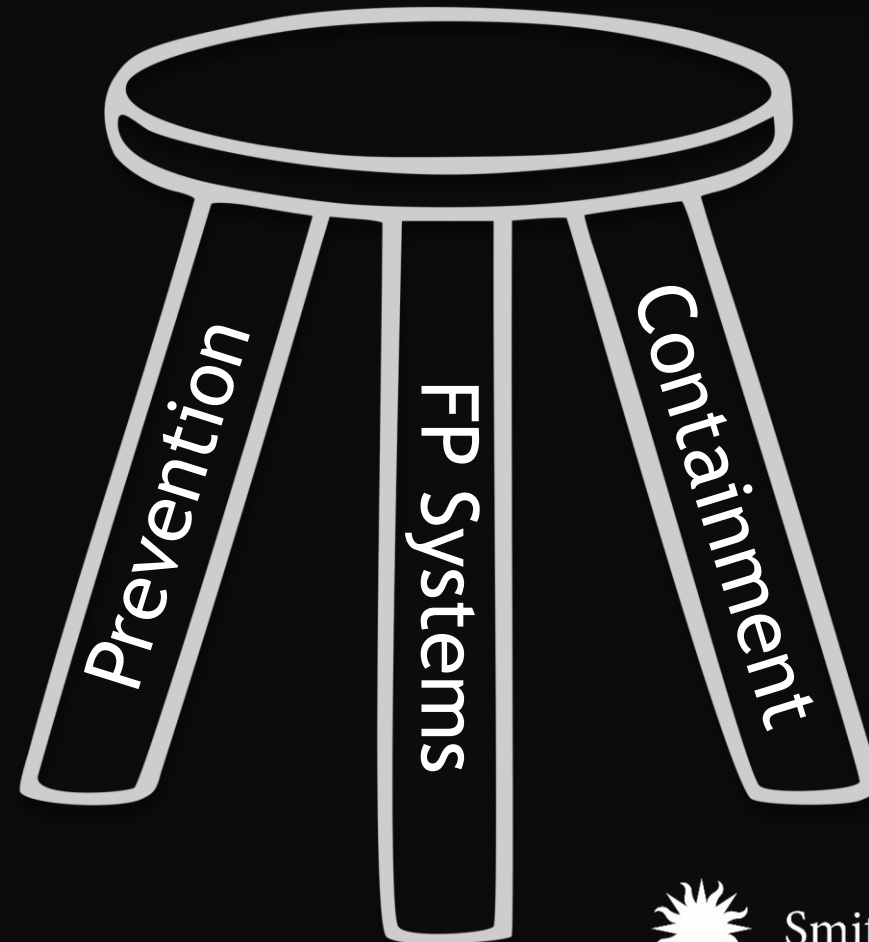
Our Goals:

- Protect Occupants
 - Control fire growth
 - Provide adequate egress
- Protect Collections
 - Effects of fire and smoke
 - Detrimental effects of fire protection
- Protect Property
 - Passive & active systems



Fire Protection Strategies

- Prevention
 - Dedicated operations
 - Combustibles
 - Ignition sources
- Fire Protection Systems
 - Fire suppression
 - Fire detection
- Containment
 - Fire-rated barriers
 - Opening protectives



Fire Prevention



- Control ignition sources
 - Smoking
 - Heat producing equipment
 - Cooking
 - Limited combustibles and electrical equipment
 - Manage hot work
- Dedicated collections storage
 - Processing and conservation must take place elsewhere
 - Limited access



Fire Prevention

- Enclosed metal cabinetry
- Hazardous collection separation
 - Cellulose nitrate film
 - Wet collections
- Excess housing materials stored elsewhere
- Noncombustible/Fire retardant construction



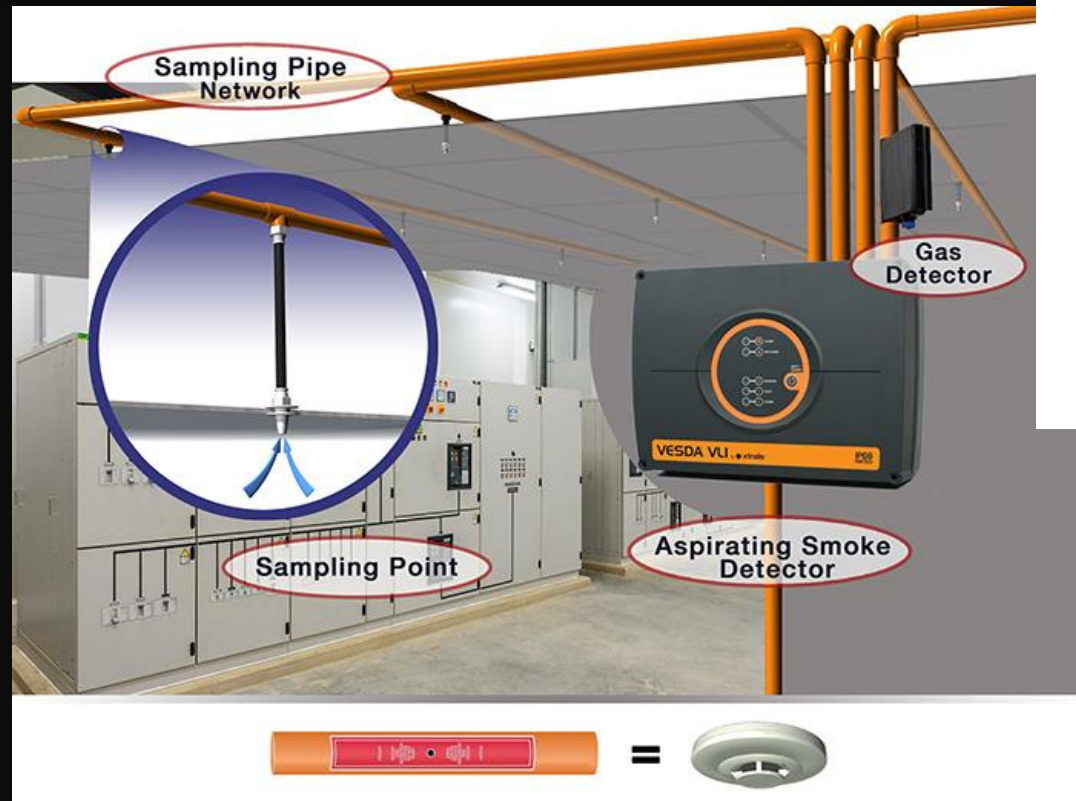
Fire Protection Systems



Fire Detection & Alarm Systems

Types of Detection:

- Spot type smoke detectors
- Heat detectors
- Beam type smoke detectors
- Ultra-violet/Infrared flame detection
- Air aspirating smoke detection



Fire Detection & Alarm Systems



Types of Notification:

- Strobes
- Horns
- Speakers



Fire Suppression Systems

- Automatic response
- Low maintenance
- Extremely reliable
- Local to a fire
- Much less water than fire department hoses



Fire Suppression Systems

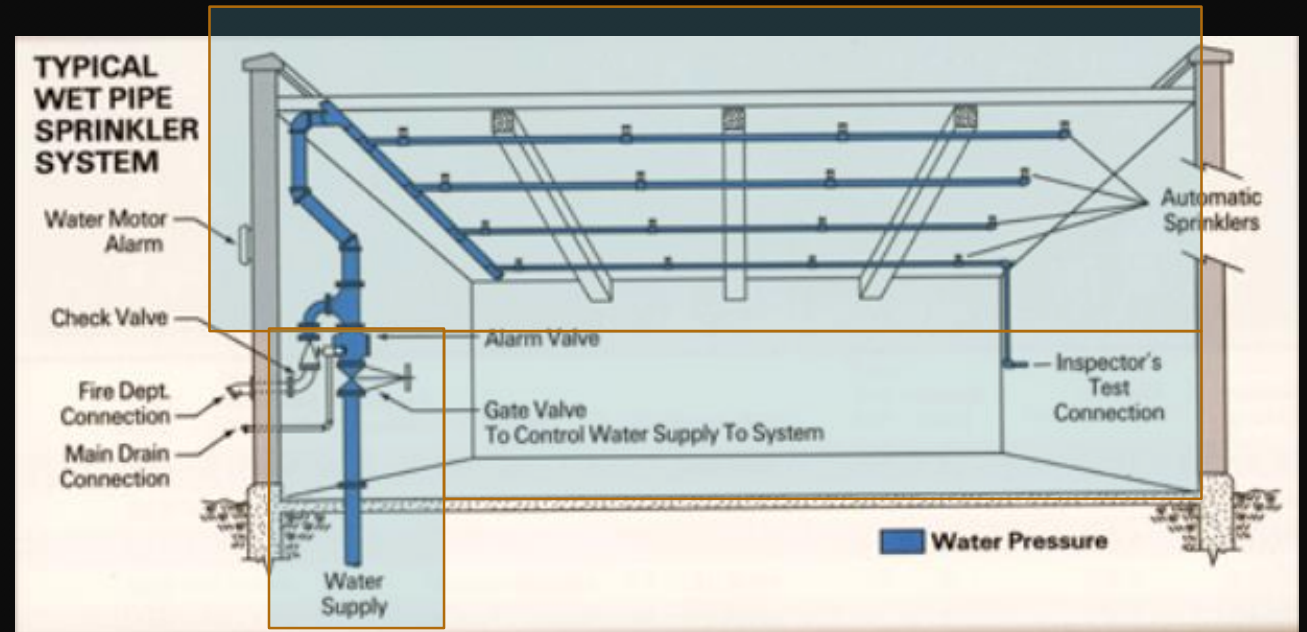
- Why have sprinklers?
 - (Extremely rare) small leaks and accidental discharges are always better than a fire
 - Wet items are always easier to salvage than burnt ones
 - Substantial difference in extent of damage



Fire Suppression Systems

Wet Pipe Sprinkler System

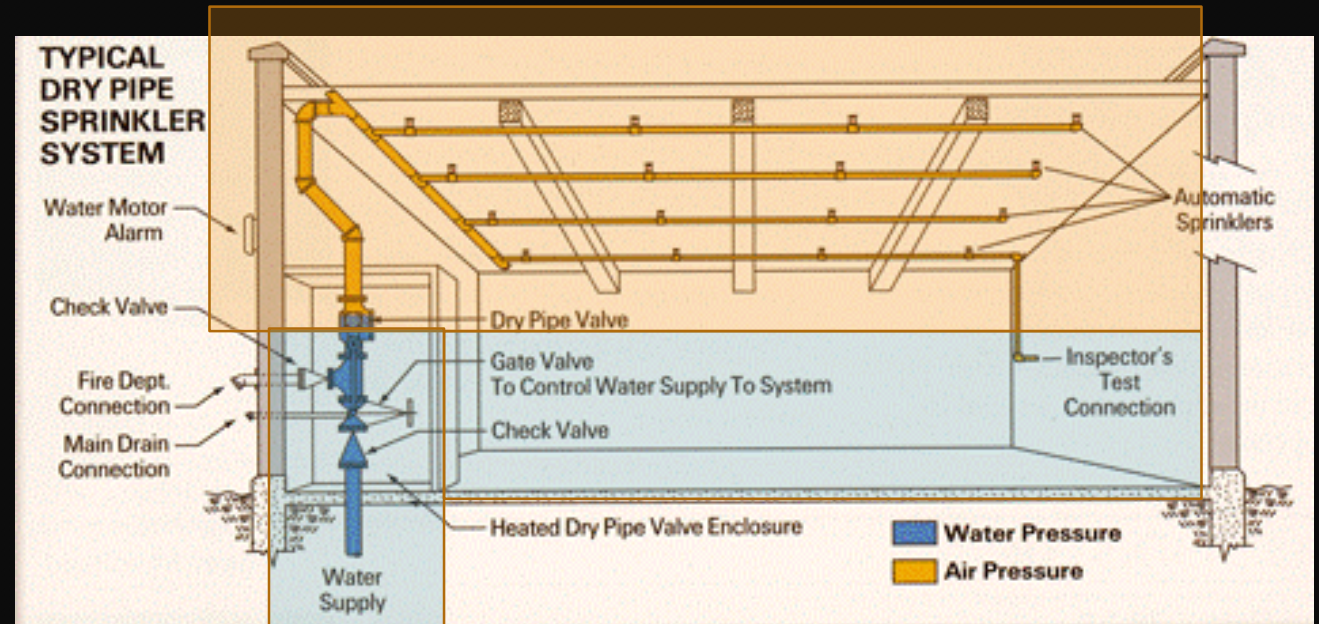
- Pipes are filled with water
- No delay in water application
- Lowest maintenance
- Most reliable



Fire Suppression Systems

Dry Pipe System

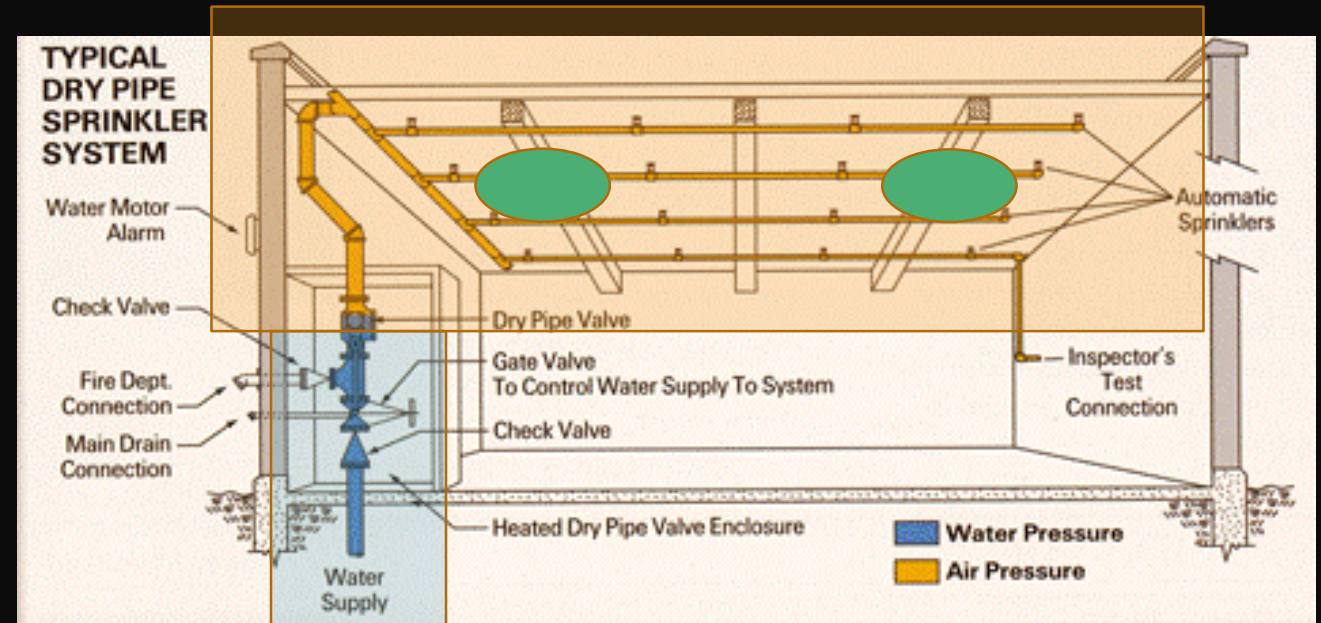
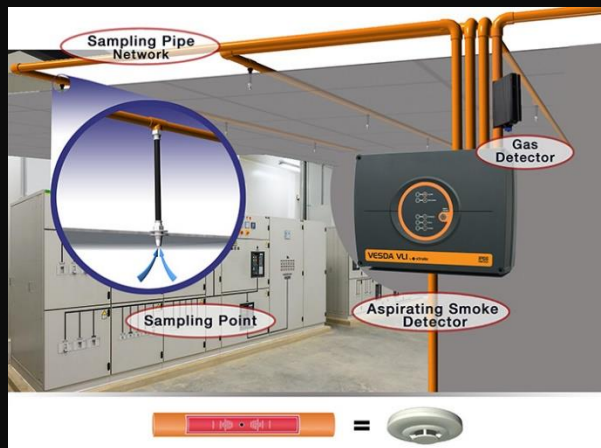
- Pipes are filled with air
- Cold areas
- Sprinkler activation allows air pressure to drop and valve to open
- Release of air, followed by water
- Delay = air release time
- Higher maintenance



Fire Suppression Systems

Preaction System

- Pipes are filled with air
- Water-sensitive areas
- Water release controlled by smoke detection
- Delay = dependent on system
- Highest maintenance



Fire Suppression - Fire Extinguishers



- Require manual intervention
- All security staff trained in their use
- **ONLY** put out a fire with an extinguisher if:
 - Alarm turned in
 - People are evacuating
 - Fire is small and contained (think trash can)
 - Escape route behind you
 - You have received training



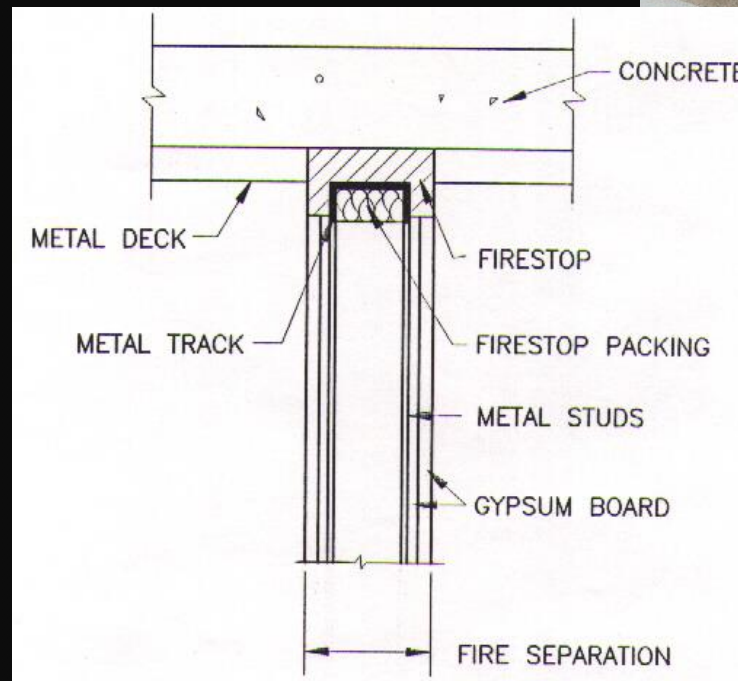
Fire Suppression - Fire Extinguishers

- Many different types
- You usually see the red dry chemical ones
- Research by Colonial Williamsburg to determine which to use on collections
- Settled on water mist, covers the most types of items, and doesn't make a mess like dry chemical



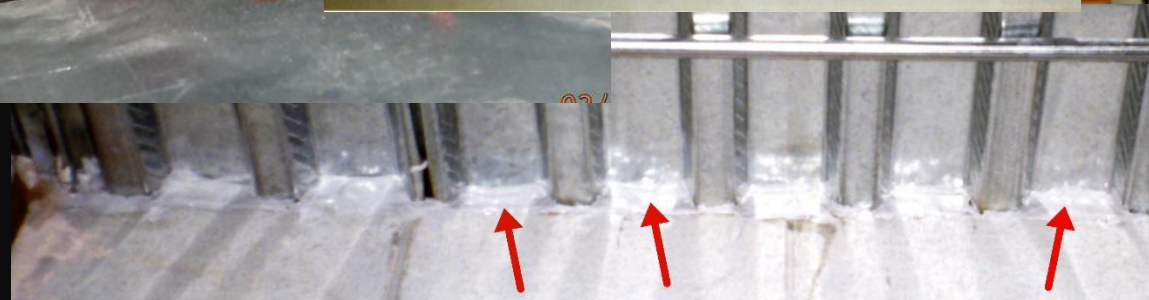
Containment - Passive Fire Protection

- Passive fire protection is a system
 - Building structure
 - Walls/Ceilings/Floors
 - Fire rated doors/windows
 - Firestopping
- Steel is not inherently fire resistant - needs insulation
- Fire barriers can also be smoke rated



Containment - Passive Fire Protection

- Fire doors and windows
- Firestopping
- Is a complete system
- Required to:
 - Keep a fire out
 - Keep a fire in
 - Keep a fire from spreading



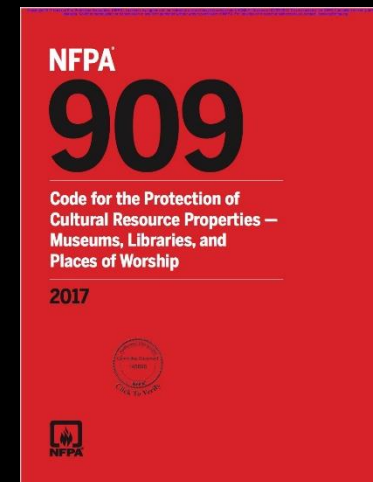
Collections Storage - All Together Now

- Prevention
 - Effective combination of policies
- Fire Protection Systems
 - Fire Suppression
 - Fire Detection
- Containment
 - Fire ratings
 - Compartmentation



What can you do to prepare?

- Talk to PRICE
- Talk to OSHM
- Tour with your local Fire Department
- NFPA 909/914



Summary

- Fires can and do happen
- Have a program in place
- Fire protection is always a multi-layered approach



