

Safety Design in Buildings



Doha Conference

Crowne Plaza Doha - The Business Park, Monday, April 18, 2016

HEALTH CARE FIRE SAFETY ALIGNED FOR OPERATIONS

2016 SAFETY DESIGN IN BUILDINGS CONFERENCE



AARON F. VANNEY, P.E., LEED® AP
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Course Description

Healthcare facilities require a unique approach to addressing Fire Safety needs of the building occupants who may not be capable of self-evacuation. The unique strategy relies on building systems and staff to safely care for the building occupants during a fire. However, it is not the intention for the Fire Strategy to prevent the care of patients during normal operations. This presentation will identify the unique Fire Safety approaches for Healthcare facilities and will identify fire safety features which may conflict with normal building operations.



Presenter

Aaron Vanney

Operations Manager, JENSEN HUGHES

Aaron F. Vanney, P.E., LEED® AP is Vice President for JENSEN HUGHES located in Dubai, United Arab Emirates. Mr. Vanney specializes in international projects including mixed use high-rise buildings, health care facilities, and convention centers. He has focused his project work in code consulting, developing building fire and life safety strategies and performance-based design.

Mr. Vanney is a member of the Society of Fire Protection Engineers (SFPE) and a member of the National Fire Protection Association (NFPA). He is a graduate of Worcester Polytechnic Institute with a degree in Mechanical Engineering and Fire Protection Engineering. He is a registered Professional Fire Protection Engineer and a certified NFPA 101 Trainer.





Learning Objectives

1. *Identify Health Care and Other Building Occupancies*
2. *Understand the Unique Operating Needs of Health Care Facilities*
3. *Recognize Fire Safety Strategies that Address Operational Needs*
4. *Understand Potential Conflicts between Fire Safety and Operations*

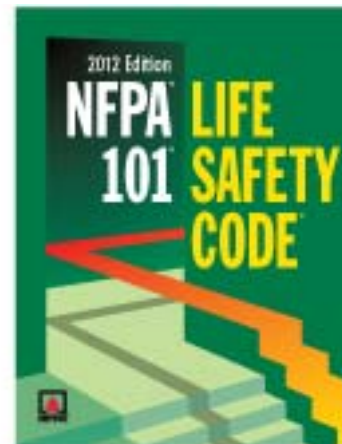
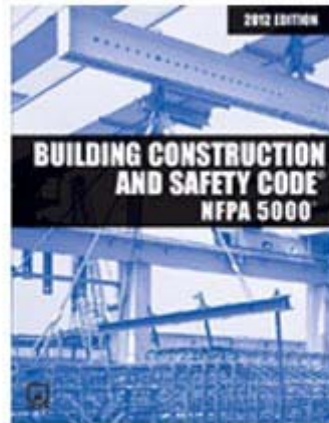
The purpose of this presentation is to convey technical knowledge to the conference participants.

The presentation also contains slides with text that summarises the content of the presentation and the main learning objectives.

These may be used to update CPD records for relevant organisations including the Chartered Institute of Building (CIOB).

CODES AND STANDARDS

- NFPA 5000, BUILDING CONSTRUCTION AND SAFETY CODE
- NFPA 101, LIFE SAFETY CODE



HEALTH CARE USES

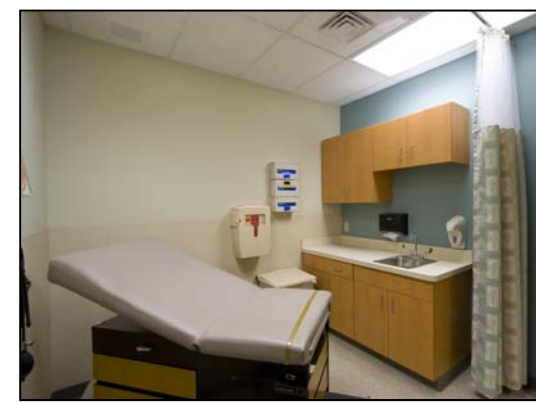
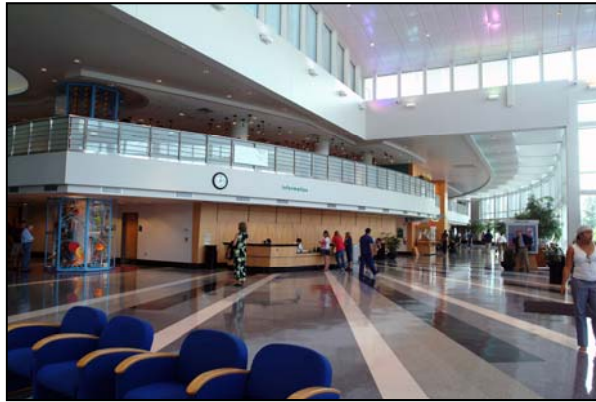


HEALTH CARE USES





HEALTH CARE USES

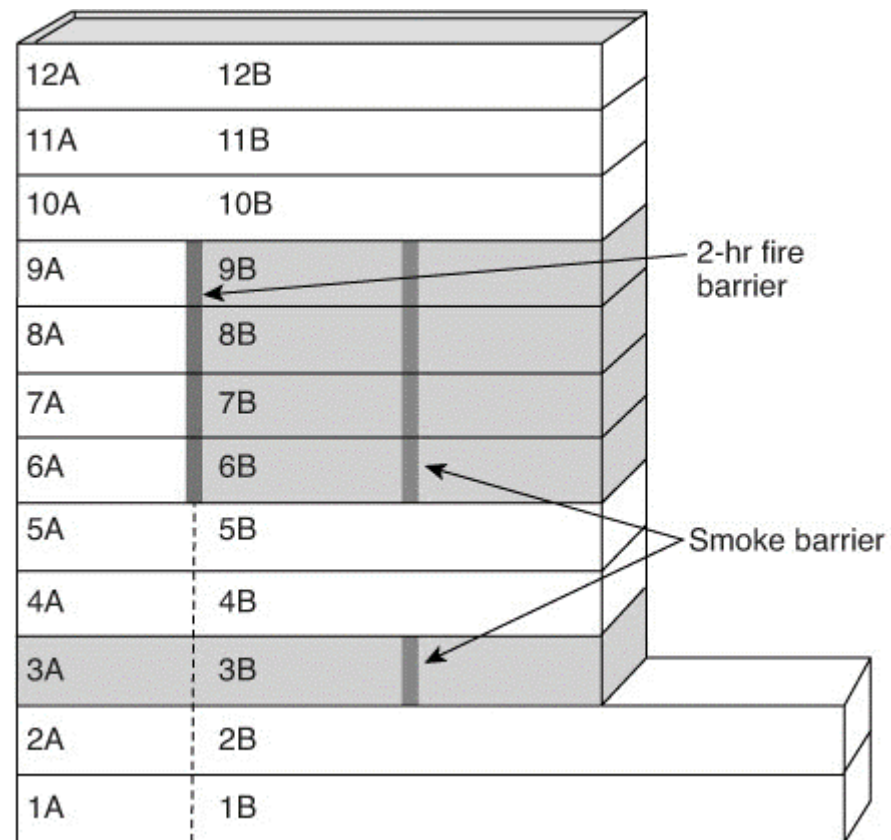




HEALTH CARE OCCUPANCIES

- Health Care Occupancy
 - Four or more patients on an **inpatient** basis, incapable of self-preservation.
- Ambulatory Health Care Occupancy
 - Four or more patients on an **outpatient** basis, incapable of self-preservation.
- Business, Assembly, Storage, Incidental
 - Most other areas.

HEALTH CARE AREAS



- Health care occupancy
- Non-health care occupancy (e.g., business occupancy)

BUILDING ACCESS AND EGRESS

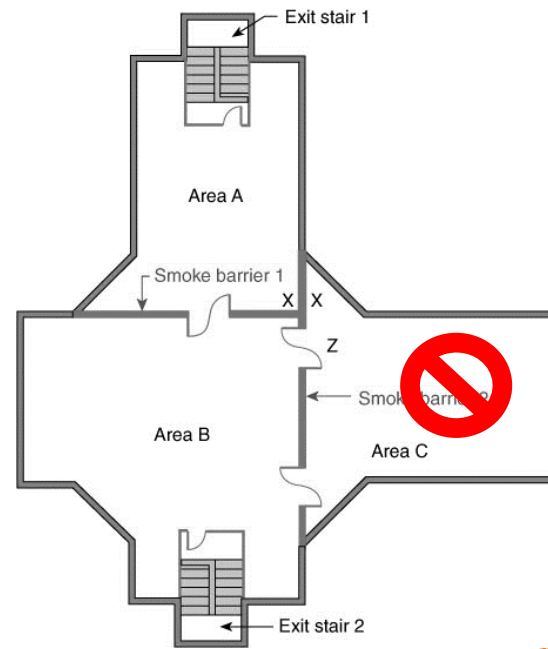
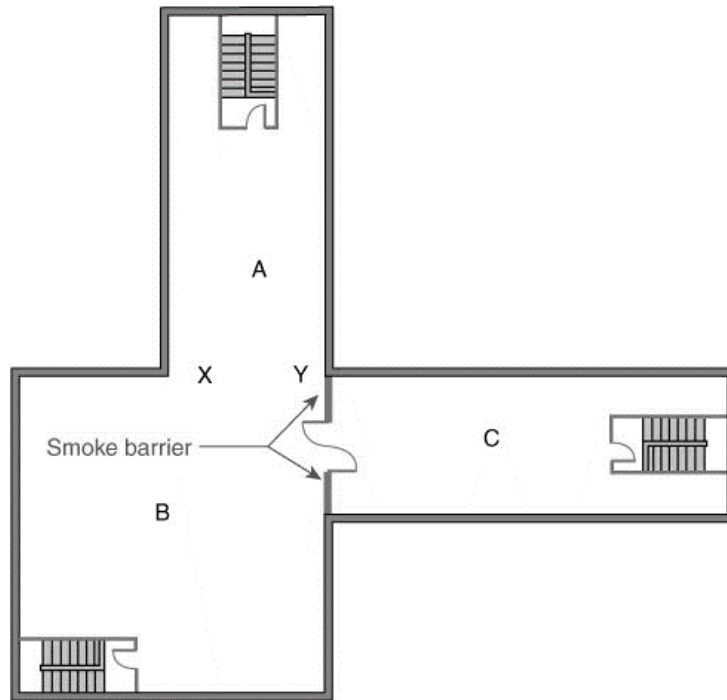




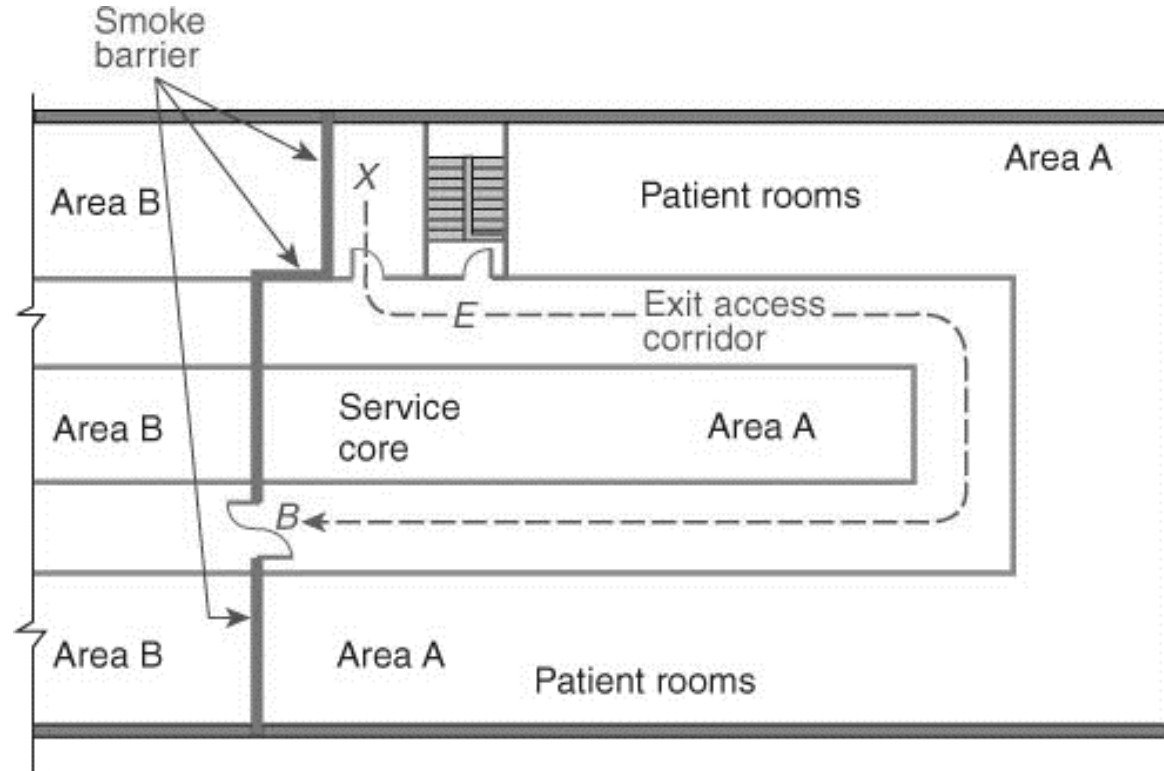
BUILDING ACCESS AND EGRESS

- REQUIREMENTS
 - Multiple Smoke Zones per Floor
 - Staged Horizontal Evacuation
 - Areas of Refuge for Bedridden Patients
 - Travel Distance less than 61 m*

BUILDING ACCESS AND EGRESS



BUILDING ACCESS AND EGRESS



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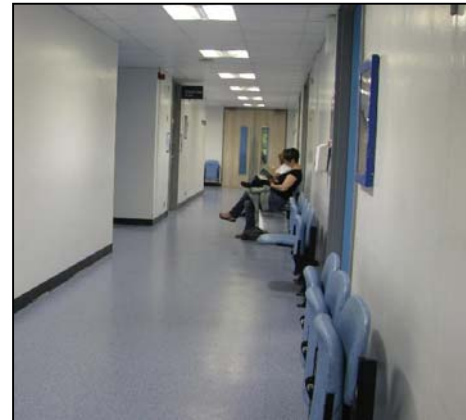
CORRIDOR ACCESS





CORRIDOR ACCESS

- CORRIDOR REQUIREMENTS
 - 2,440 mm Wide
 - 150 mm Obstructions below 965 mm
 - Wheeled Equipment
 - Fixed Furniture





CORRIDOR ACCESS

- **CROSS-CORRIDOR DOOR REQUIREMENTS**
 - 20 Minute Fire Rated (Equivalent)
 - 2,110 mm Clear Width (Pair)
 - 1,055 mm Clear Width (Single)
 - Self-closing
 - Latching Hardware Not Required
 - Center Mullions Prohibited
 - Astragals at Meeting Edges of Doors
 - Stops Required



CORRIDOR ACCESS





PATIENT DOORS





PATIENT DOORS

- CORRIDOR CONSTRUCTION
 - Restrict the Passage of Smoke
- CORRIDOR DOORS
 - Restrict the Passage of Smoke
 - Limited Floor Clearance
 - Positive Latching
 - Not Self-closing



PATIENT NOTIFICATION



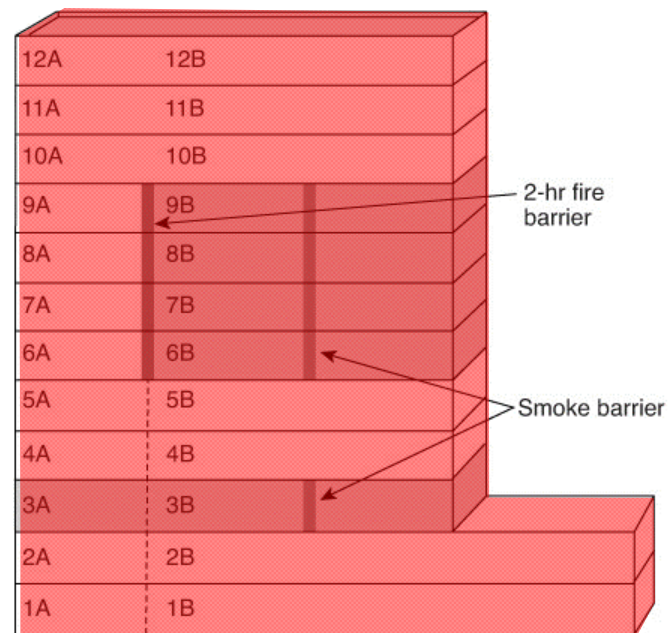


PATIENT NOTIFICATION

- ALLOWANCE
 - Zoned Notification
 - Private Operating Mode
 - Omitting Audible Appliances in Critical Care Areas (Visible Only)
 - Omitting Manual Pull Stations at Patient Sleeping Area Exits if Located at Nurses Control Station

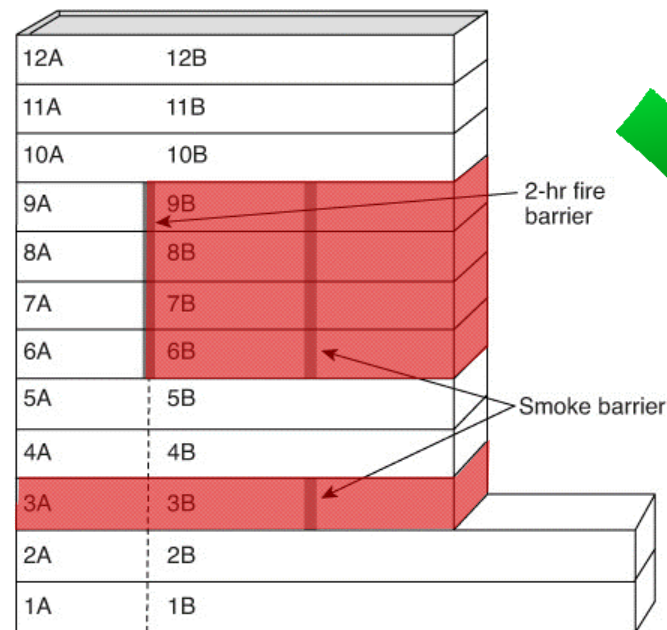
ENHANCEMENT DETRIMENT

- FULL BUILDING MIXED OCCUPANCIES



ENHANCEMENT DETRIMENT

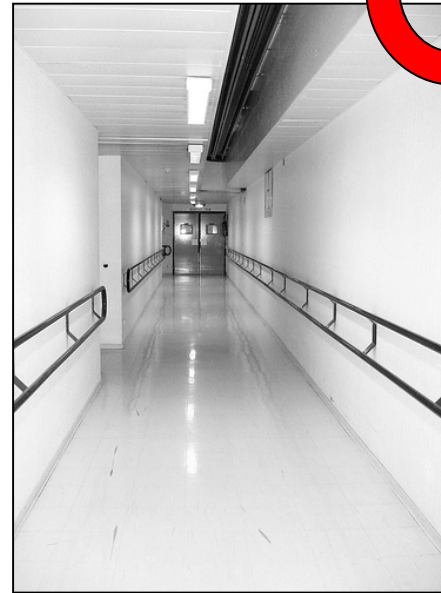
- SEPARATED OCCUPANCIES



- Health care occupancy
- Non-health care occupancy (e.g., business occupancy)

ENHANCEMENT DETRIMENT

- INCREASED FIRE RATINGS
 - Smoke Barriers forming Zones
 - Corridor Walls
 - Patient Rooms
 - Patient Suites
 - Typical Rooms



ENHANCEMENT DETRIMENT

- INCREASED FIRE RATINGS
 - Increased Fire/Smoke Dampers
 - Fire Alarm Programming
 - Monitoring
 - Maintenance
 - Reduced Door Functionality
 - Prohibited Openings
 - Pass-through Openings
 - Reduced Patient Windows / Monitoring





ENHANCEMENT DETRIMENT

- FAIL SAFE BUILDING SYSTEMS
 - Full Building Evacuation
 - Full Elevator Recall
 - Full Medical Gas Shutdown
 - Full HVAC Shutdown
 - Full Emergency Power





ENHANCEMENT DETRIMENT

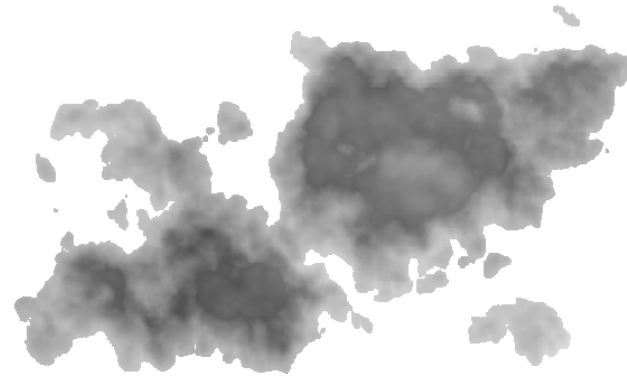
- FAIL SAFE ZONED SYSTEMS
 - Zoned Evacuation
 - Lobby-based Elevator Recall
 - Zoned HVAC Shutdown
 - Branch Circuit Emergency Power





ENHANCEMENT DETRIMENT

- ACTIVE ZONED SMOKE CONTROL
 - Smoke Exhaust from Zones
 - Makeup Air to Alarm or Adjacent Zones
 - HVAC Shutdown
 - Smoke Dampers



ENHANCEMENT DETRIMENT

- PASSIVE ZONED SMOKE CONTROL
 - Smoke Barrier Zones
 - Self-closing Zone Doors
 - Automatic Sprinkler Protection





ENHANCEMENT

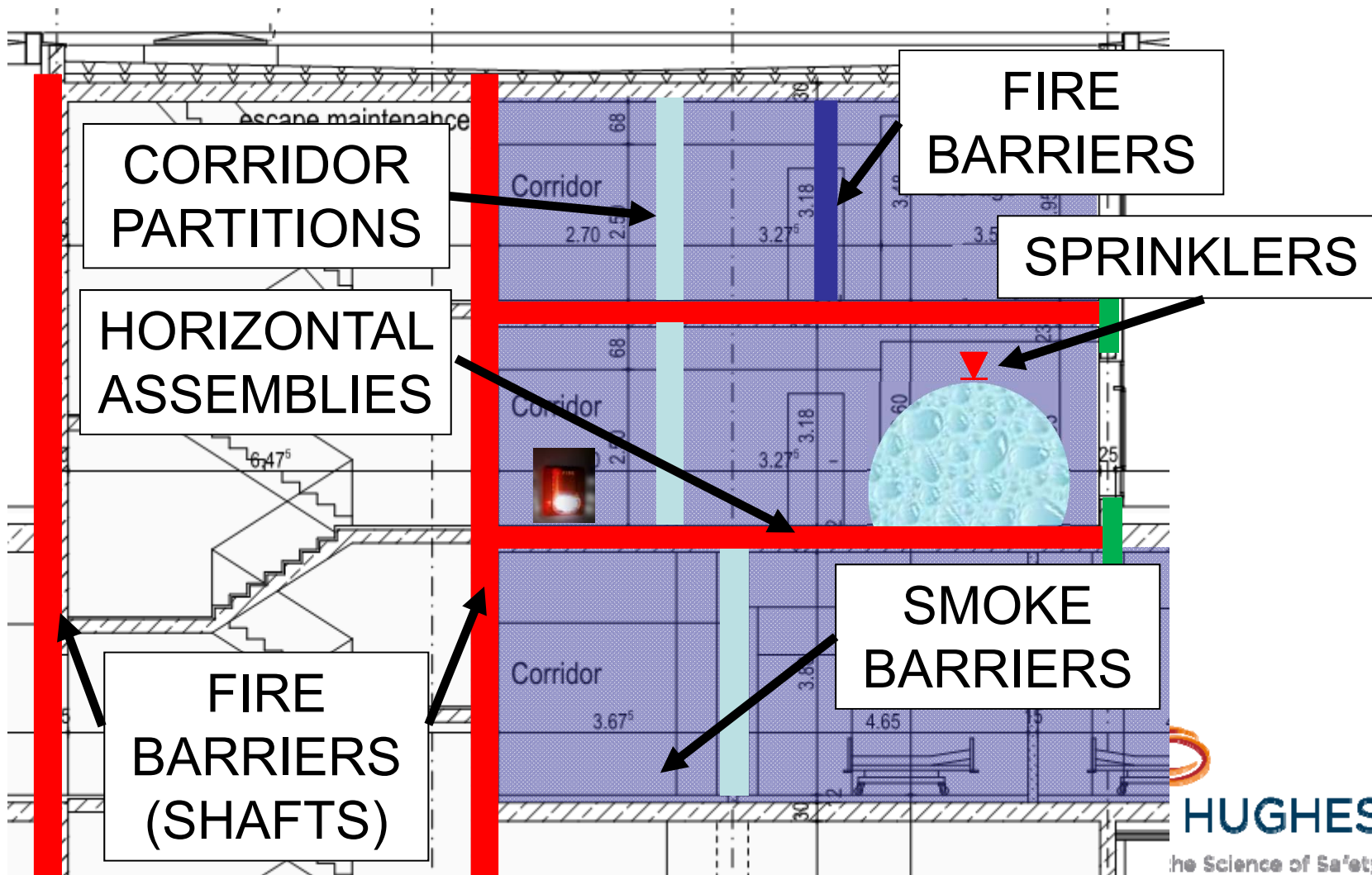
- **ELEVATOR ZONING**
 - Arranged to be Accessible without Passing Through Zone of Alarm
- **FIRE ALARM / SPRINKLER ZONING**
 - Coincide with Smoke Zoning to Allow Zoned Evacuation / System Shutdown
- **PUBLIC CORRIDOR NETWORK**
 - Free Egress without Compromising Security Zones



ENHANCEMENT

- **SURGICAL WARD**
 - Surgery Suites within Adjoining Compartments
 - Sprinkler System Versus Pre-action System
- **HYPERBARIC CHAMBERS**
 - Deluge Spray System
 - Radiation (Flame) Detection

COMPREHENSIVE STRATEGY



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