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HEALTH CARE FIRE SAFETY ALIGNED FOR OPERATIONS

17th October 2016

JAMAL ALI

SHAMIM RASHID-SUMAR, P.E.

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Safety Design in Buildings

Cairo Conference

Monday, October 17, 2016, JW Marriott Hotel Cairo

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.

Co-Presenter

Jamal Ali

Project Director, JENSEN HUGHES

Jamal Ali has been in the fire protection engineering field in the Middle East for over 20 years, after completing his Master's thesis in Fire Risk Analysis, combining site inspection and code compliance with computer modeling analysis. Since graduating with a Master of Science in Fire Protection Engineering from the Technical University of Denmark, he has been involved in a vast range of projects including hospitals, airports, retail development complexes, residential buildings, offices, schools, sports stadiums, theatres, industrial plants and high-rise and super tall buildings. He has also been involved with training authorities having jurisdiction, clients and architects, most recently as an NFPA 101 international instructor.

Prior to moving to the fire protection consulting industry, Mr. Ali's work experience includes five years as a building regulator with Dubai Municipality's Building Department, where he served on the technical committee for the accreditation of third-party inspectors, as well as four years as a fire engineer with Abu Dhabi Civil Defense, where he was a Senior Member and Coordinator of the Technical Committee that developed the original UAE fire code.

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Co-Presenter

Shamim Rashid-Sumar

Director of Business Development – Middle East/ Project Director, JENSEN HUGHES

Shamim Rashid-Sumar has 16 years of experience in building and fire code consulting, fire dynamics, timed egress modeling, and performance based design. She is the firm's director of business development for the Middle East. After earning her degree in fire protection engineering from the University of Maryland, she worked for six years in the Baltimore-Washington, DC, before taking an assignment in the Middle East to grow the firm's Dubai operations and served as Vice President of Middle East Operations. Her project experience includes hospitals, airports, U.S. federal government facilities, laboratories, hotels, residential apartments, high-rise buildings, and mixed-use facilities. Her specialties include life safety code consultation, fire dynamics and timed egress modeling for atrium smoke control systems, and fire alarm systems design. She is a member of the United Arab Emirates (UAE) Fire Code Committee, an NFPA 101 International Instructor, and a member of the SFPE International Committee on Membership and Chapters Relations.

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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).

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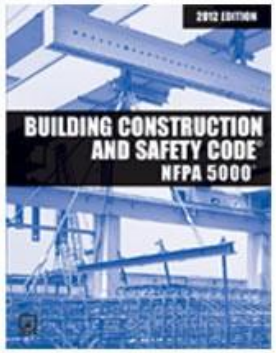
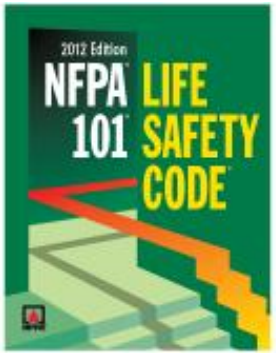
CODES AND STANDARDS

- NFPA 5000, BUILDING CONSTRUCTION AND SAFETY CODE
- NFPA 101, LIFE SAFETY CODE
- OTHER
  - Local Regulations
  - NFPA 99, Health Care Facilities Code





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HEALTH CARE USES

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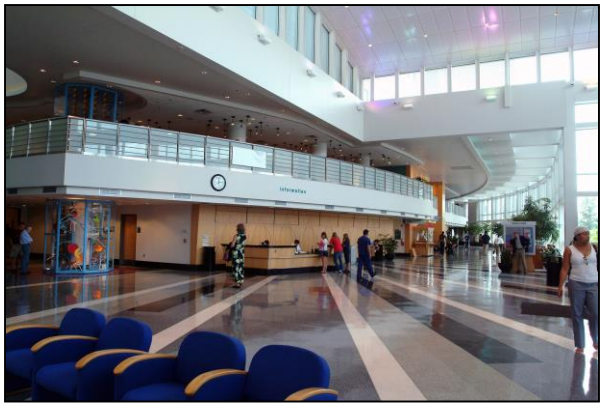
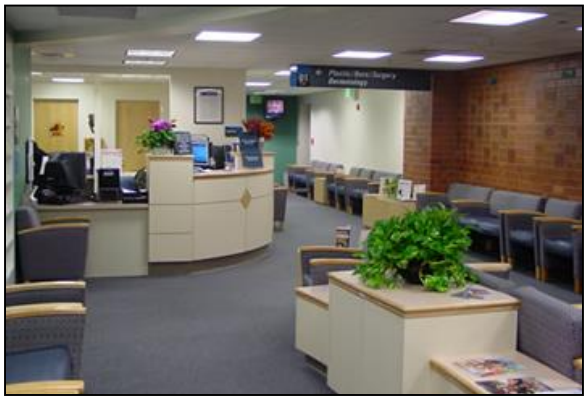
HEALTH CARE USES



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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.

TOTAL CONCEPT – DEFEND IN PLACE

- Isolation of fire and transfer of patients
- Minimize the possibility of having to evacuate patients
  - Trained Staff
    - Fire Prevention procedures, training, and drills
  - Operation and Maintenance
    - Design, Construction, Compartmentation
    - Detection, Alarm, and Extinguishment

TOTAL CONCEPT – DEFEND IN PLACE

Cross-corridor smoke barrier doors, which are part of the "defend-in-place" protection strategy.

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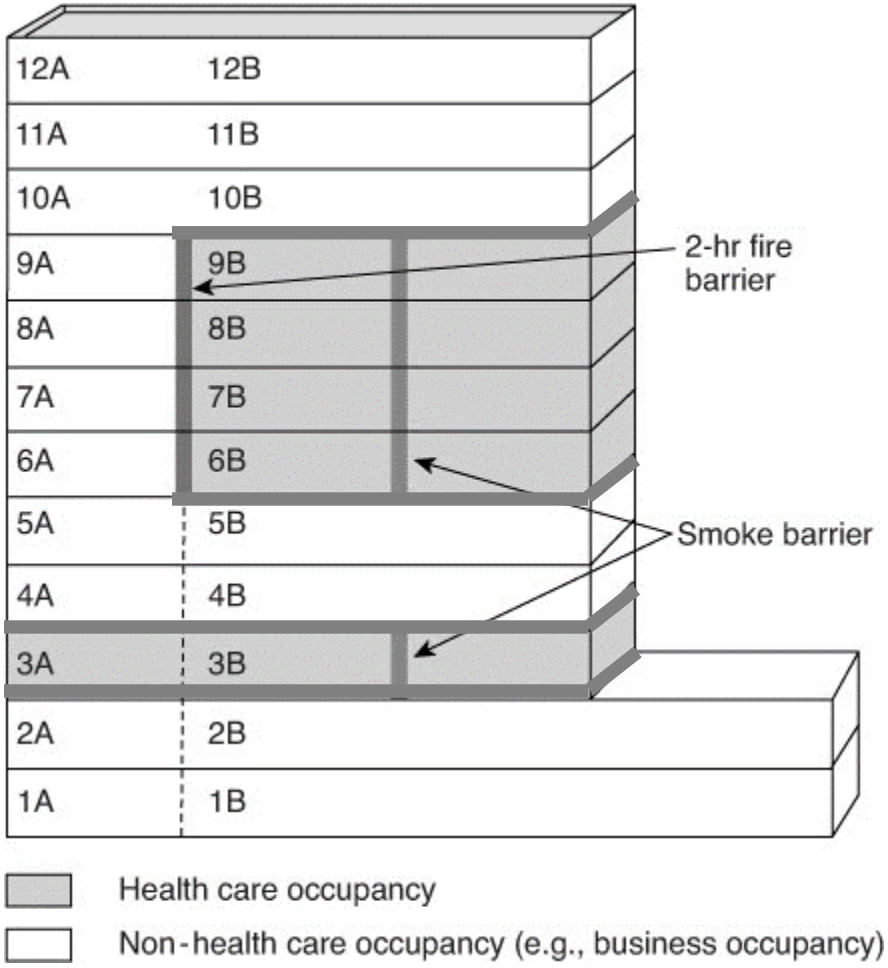
HEALTH CARE AREAS



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BUILDING ACCESS AND EGRESS

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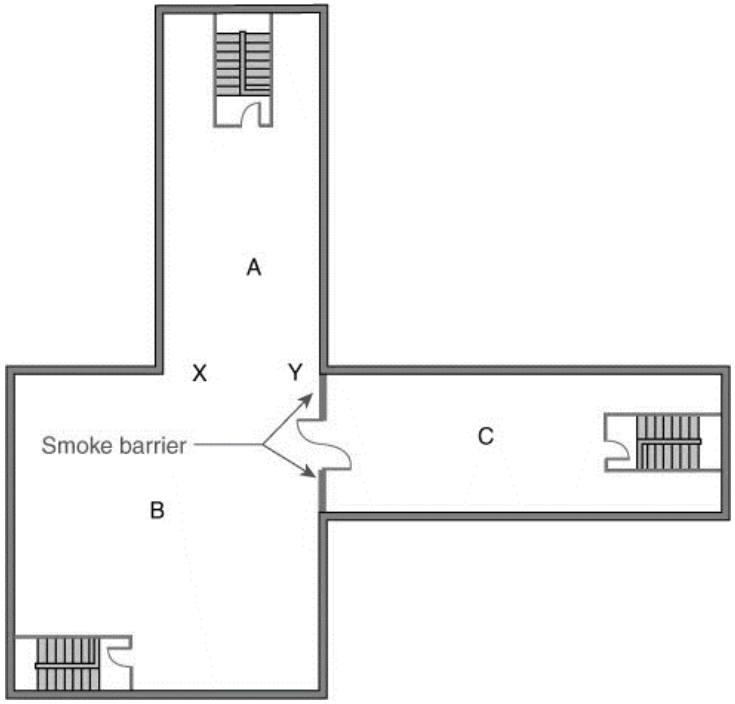
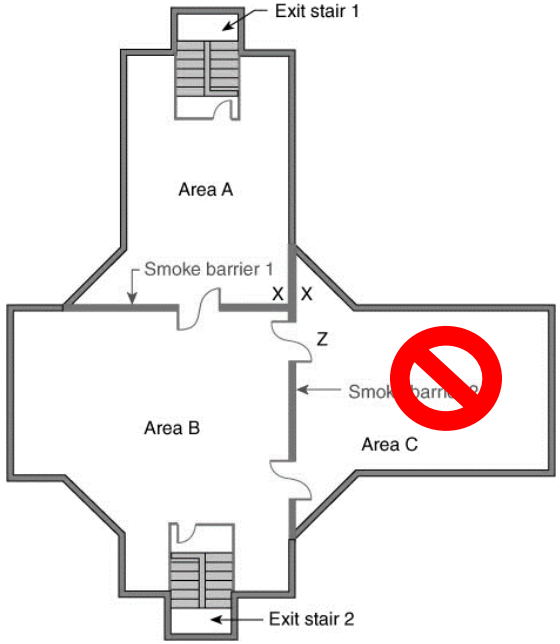
BUILDING ACCESS AND EGRESS

- 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





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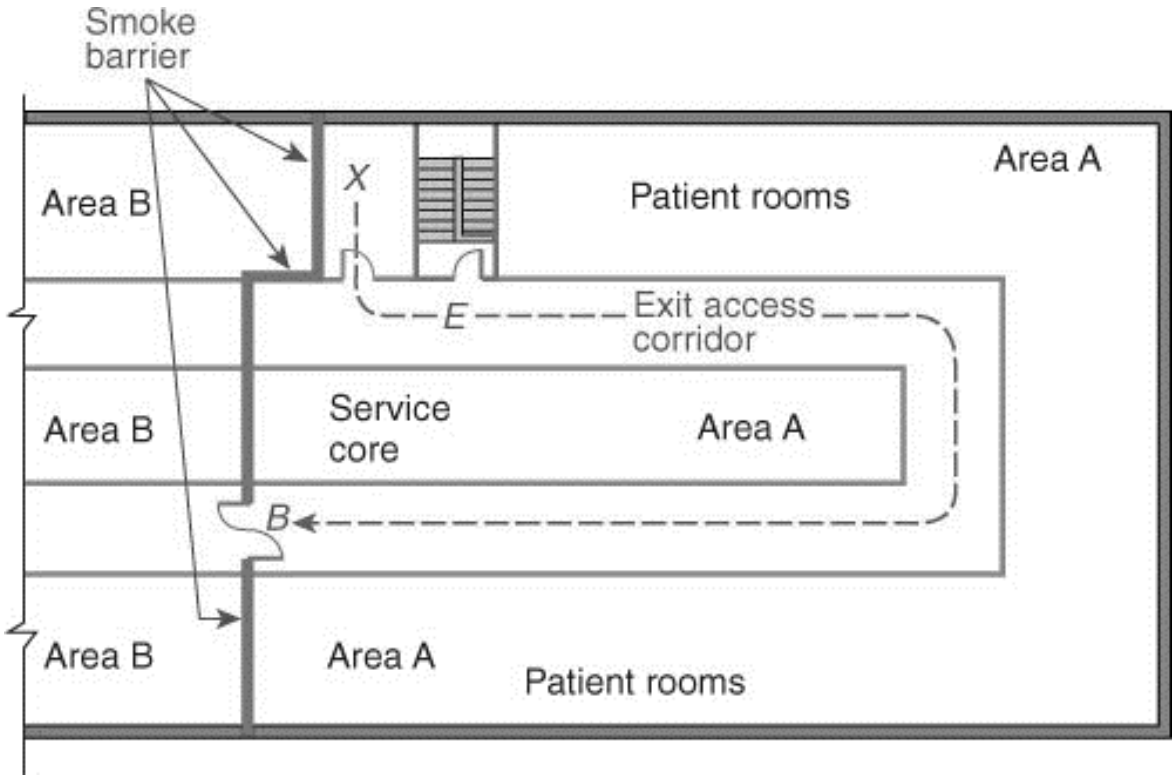
BUILDING ACCESS AND EGRESS



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CORRIDOR ACCESS

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CORRIDOR ACCESS

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

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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

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PATIENT DOORS

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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

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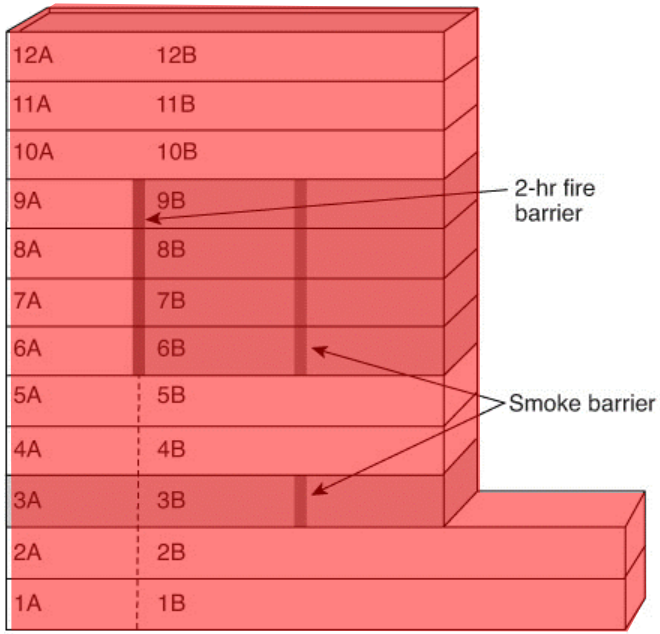
PATIENT NOTIFICATION

- 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

ADVERSE ENHANCEMENTS

- FULL BUILDING MIXED OCCUPANCIES



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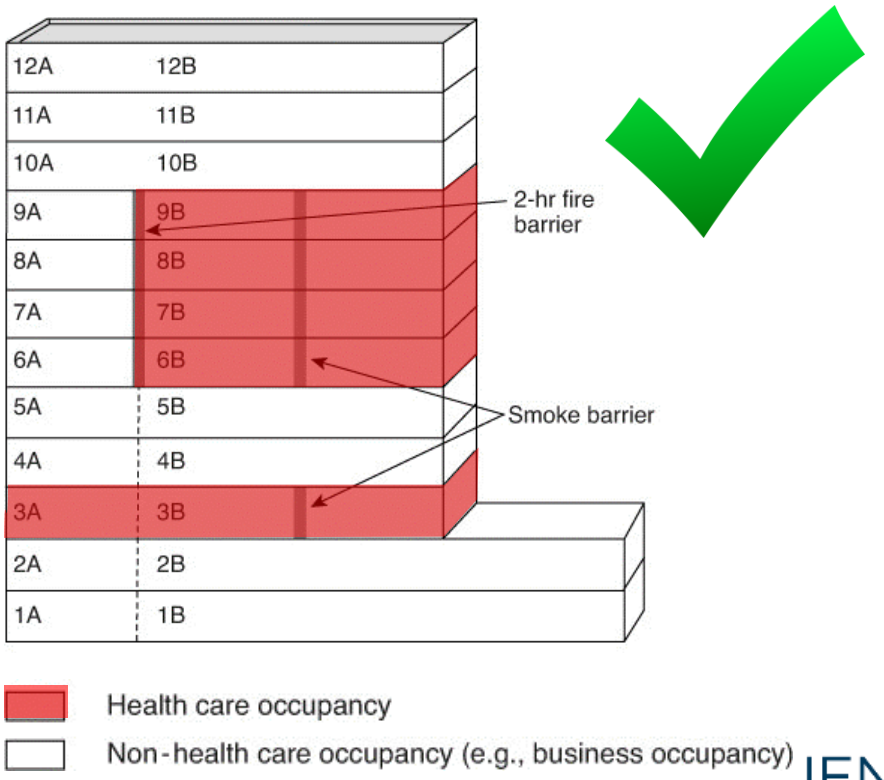
ADVERSE ENHANCEMENTS

- SEPARATED OCCUPANCIES



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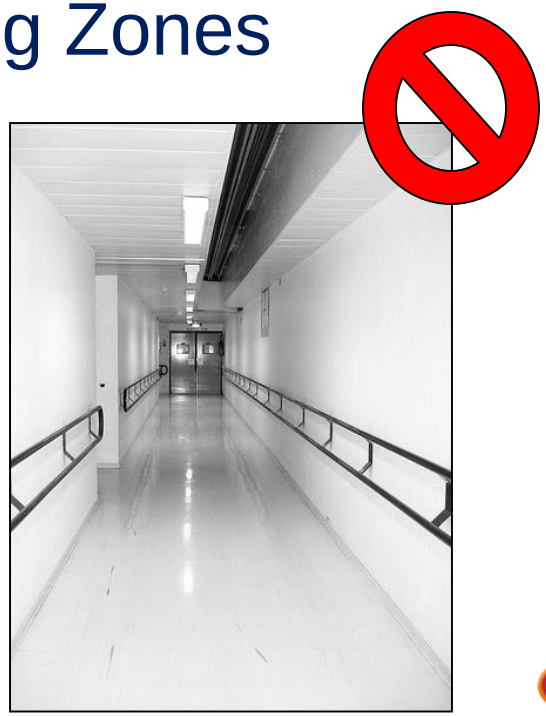
ADVERSE ENHANCEMENTS

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



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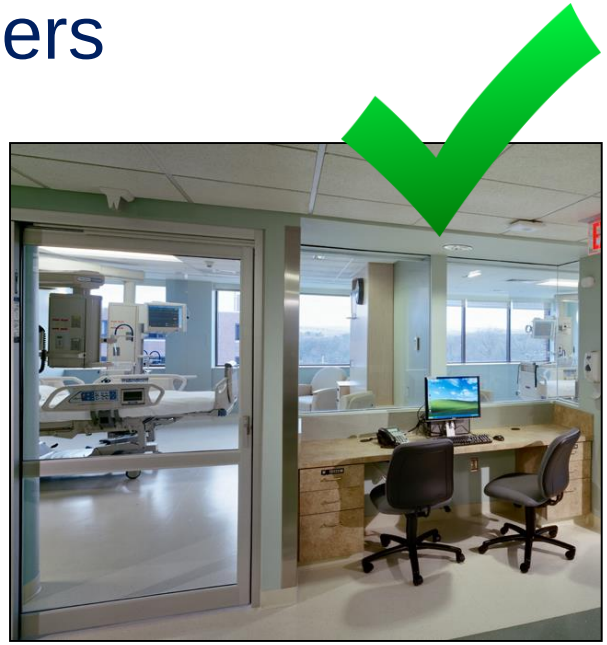
ADVERSE ENHANCEMENTS

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



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ADVERSE ENHANCEMENTS

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

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ADVERSE ENHANCEMENTS

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

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ADVERSE ENHANCEMENTS

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

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ADVERSE ENHANCEMENTS

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

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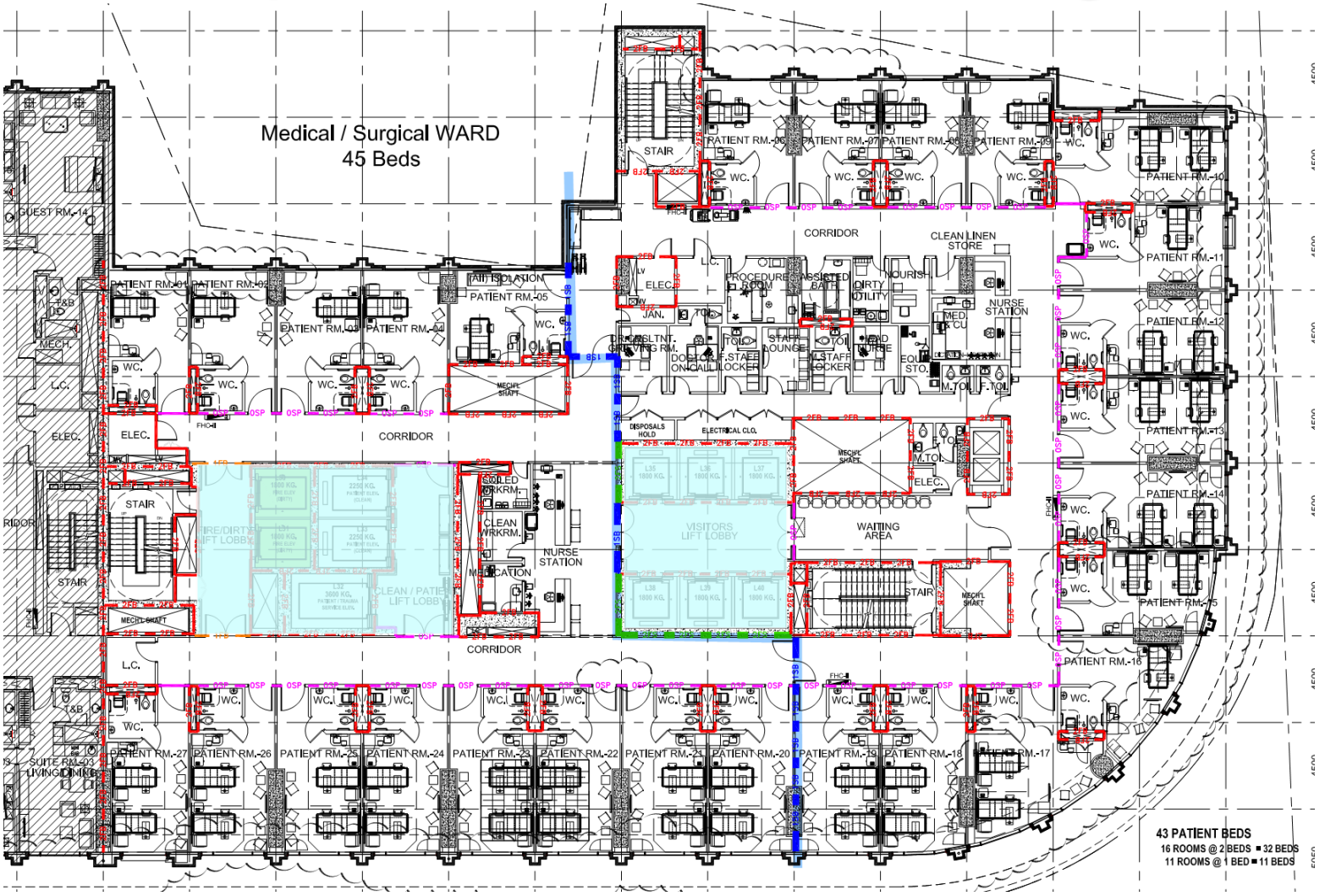
ENHANCEMENT

- 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

Sample Elevator Zoning



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ENHANCEMENT

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

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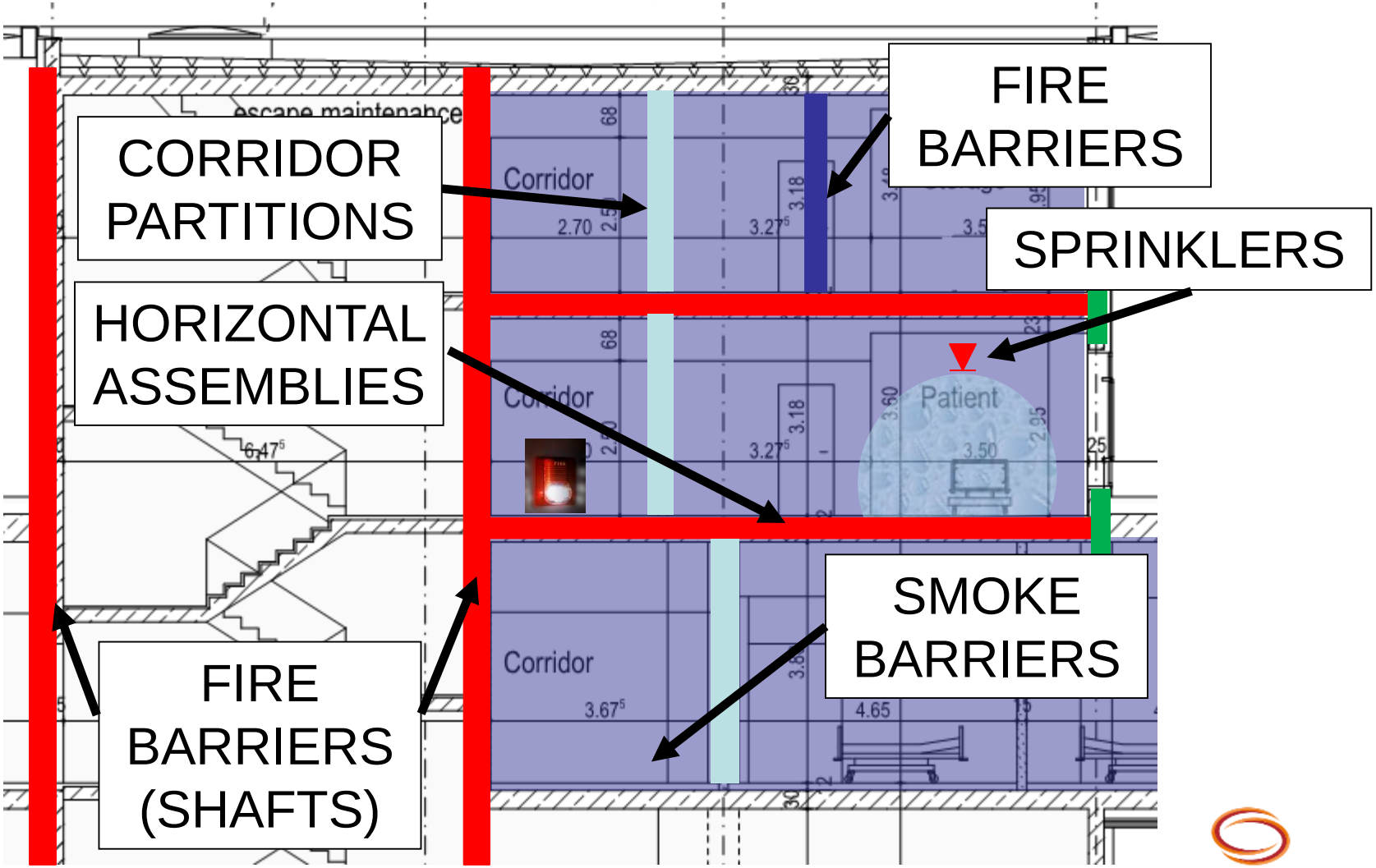
COMPREHENSIVE STRATEGY



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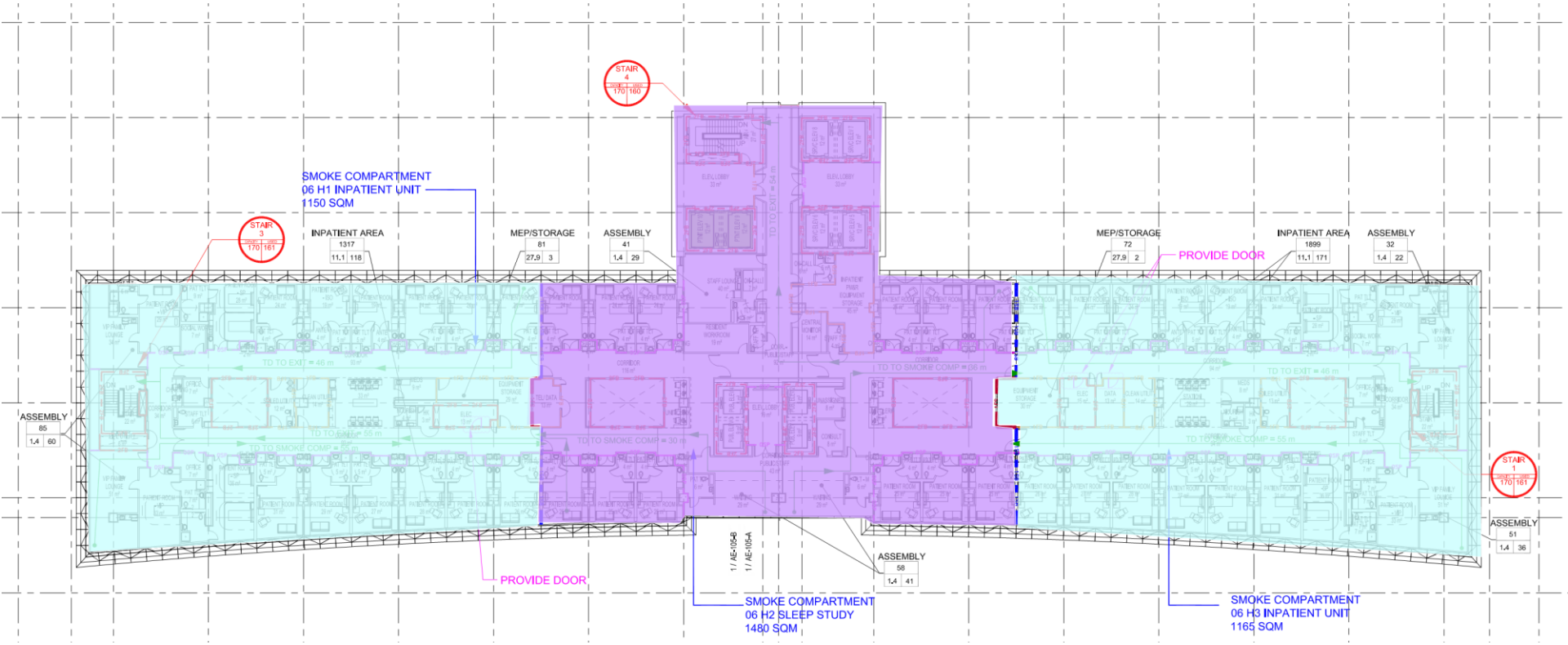
Sample FLS Drawing



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TOTAL CONCEPT

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QUESTIONS?

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