

Bill Koffel, President  
Koffel Associates, Inc.


**EXPANDING THE HORIZONS OF HEALTHCARE**  
35<sup>TH</sup> ANNUAL AHCA DESIGN & CONSTRUCTION SEMINAR  
57<sup>TH</sup> ANNUAL FHEA MEETING & TRADE SHOW  
OCTOBER 6-9, 2019

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**Review of NFPA 101-2018 and IBC 2018**

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Course Number: AHCA2019\_12  
Credit Designation: 1 AIA CES Learning Units/HSW  
AIA CES Provider Number: E240  
October 7, 2019




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William E. Koffel, P.E., FSFPE



- President of Koffel Associates, Inc.
- Serves on numerous NFPA technical committees
- Member – ICC Committee on Healthcare
- 40+ years industry experience

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**AIA Learning Objectives**

**1 OBJECTIVE** Identify at least five significant differences between the IBC and NFPA 101 related to new health care occupancies.

**2 OBJECTIVE** Identify at least three subtle differences between the IBC and NFPA 101 related to new health care occupancies.

**3 OBJECTIVE** Identify at least three differences between NFPA 101 - 2012 and NFPA 101 - 2018 related to new health care occupancies.

**4 OBJECTIVE** Identify at least three differences in the reference standards contained in NFPA 101-2012, NFPA 101-2015, and the IBC-2018.

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**Applicable Codes**

- 2012 Edition of NFPA 101, The Life Safety Code® (LSC)
  - Currently enforced by accreditation organizations
- International Building Code
  - 2015 and 2018 Editions
- Facility Guidelines Institute (FGI) Guidelines for Design and Construction of Hospitals and Outpatient Facilities
  - 2014 Edition

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**NFPA 101 : Life Safety Features**

REQUIREMENTS FOR NEW

REQUIREMENTS FOR EXISTING

NOT PERMITTED STOP

PERMITTED WITH CAUTION AND RESEARCH CAUTION

PER CHAPTER 43

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Suites

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- NFPA 101 Suites Section – Reorganized in 2012
- General
    - Separation, hazardous areas, subdivision
  - Sleeping suites
    - Arrangement, number of means of egress, size, travel distance
  - Non-sleeping suites
    - Organized the same as sleeping
  - Non-patient care suites
    - In accordance with primary use of the suite

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- When to Utilize Suites
- When there is patient care open to corridors
    - Treatment bays, non-latching doors, direct patient access, etc.
  - When staff needs quick access to equipment or supplies
    - Case carts, patient transport, equipment...
    - Operating rooms, ICUs, Emergency departments
    - Such items would typically restrict clear width
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Suite or Sour?

- Emergency Department
  - Latching doors
  - Constant corridor clutter
  - Daily overflow results in patient treatment in corridors




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Suite!

- Creating a suite
  - Defining area
  - Adding separations
    - Doors and walls
  - Maintaining egress
    - Exit access
    - Dead-ends




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When to NOT Utilize Suites

- If a suite would limit access to exits
  - Cannot egress from a corridor through a suite
- By definition, a corridor has access to TWO exits
  - NFPA 101 §18.2.5.4 *Every corridor shall provide access to not less than two approved exits in accordance with 7.4 and 7.5 without passing through any intervening rooms or spaces other than corridors or lobbies.*
- If a suite would create a dead-end (30 ft)

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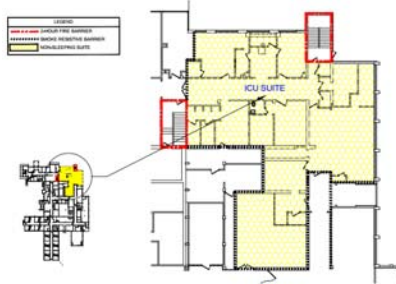
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Suites – Potential Challenges



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General Suite Requirements

- Separation from other suites and spaces
  - Must meet corridor requirements
- Hazardous areas
  - No intervening rooms
  - Separations from remainder of suite
- Subdivision
  - Not required to be fire rated (unless hazardous)

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NFPA 101: Suite Intervening Rooms

- 2012 edition eliminates the limit on the number of intervening rooms in both sleeping and non-sleeping suites
- 100 ft distance to an exit access door regardless of the number of intervening rooms

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Patient Sleeping Suites



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Sleeping Suites

- Arrangement
- Number of Means of Egress
- Travel Distance
- Maximum Size



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Sleeping Suites: Arrangement

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| <ul style="list-style-type: none"> <li>• 2012 LSC §18.2.5.7.2.1:           <ul style="list-style-type: none"> <li>• One option is to limit to 8 patient care beds OR</li> <li>• Traditional suite               <ul style="list-style-type: none"> <li>• Direct supervision OR</li> <li>• Smoke detection in sleeping rooms</li> </ul> </li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• 2015/2018 §IBC407.4.4.5:           <ul style="list-style-type: none"> <li>• Limited to 8 patient care beds OR</li> <li>• Direct and constant supervision OR</li> <li>• Smoke detection in sleeping rooms</li> </ul> </li> </ul> |
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Sleeping Suites: Arrangement



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Sleeping Suites: Intervening Rooms

CODE	NUMBER OF INTERVENING ROOMS*
2012 LSC	No limitation
2012 IBC §407.4.3.5.1	Up to 1
2015 IBC §407.4.4.3	Up to 3
2018 IBC §407.4.4.3	Up to 3

- 2015 and 2018 IBC limit by "passage through more than 3 doors"
- \*Travel distance to exit access corridor must be met

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CODE	SUITE LARGER THAN 1,000 SQ FT	SUITE LESS THAN 1,000 SQ FT
2012 LSC §18.2.5.7.2.2(A)	2*	1
2015 IBC §407.4.4.5.2	2*	1
2018 IBC §407.4.4.5.2	2*	1

- For 2 MOE:
  - 1 MOE direct to corridor
  - Other can be to adjacent suite

\* Doors must be remote

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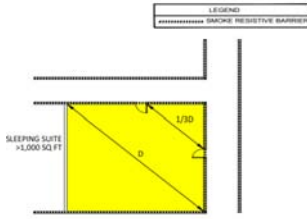
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Number of Means of Egress



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Sleeping Suites: Travel Distance

CODE	MAX DISTANCE TO EXIT ACCESS	MAX DISTANCE TO EXIT
2012 LSC §18.2.5.7.2.4	100 ft	200 ft
2012 IBC §407.4.3.5.3, Table 1016.2	100 ft: ≤1 intervening room	200 ft
2015 IBC §407.4.4.3, Table 1017.2	100 ft: passage through ≤3 doors 125 ft w/SD system	200 ft
2018 IBC §407.4.4.3, Table 1017.2	100 ft: passage through ≤3 doors 125 ft w/SD system	200 ft

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Sleeping Suites: Maximum Size

CODE	MAX SIZE (SQ FT)
2012 LSC §18.2.5.7.2.3	7,500 10,000 w/direct supervision and complete SD system
2012 IBC §407.4.3.5.1	5,000
2015 IBC §407.4.4.5.1	7,500 10,000 w/ complete SD system
2018 IBC §407.4.4.5.1	7,500 10,000 w/ complete SD system

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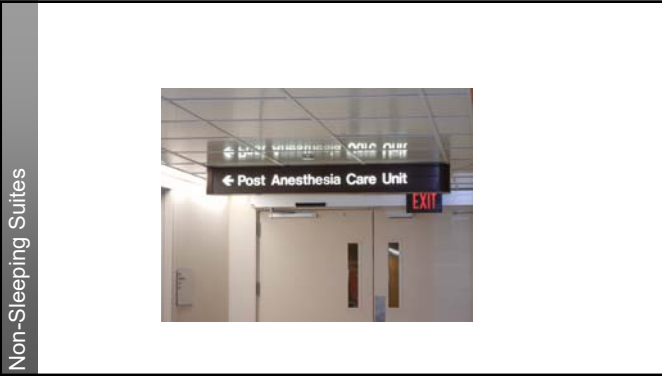
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Non-Sleeping Suites

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- Arrangement
- Number of Means of Egress
  - Egress through adjoining suite permitted (2nd route)
- Travel Distances
- Maximum Size

Non-Sleeping Suites

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CODE	NUMBER OF INTERVENING ROOMS*
2012 LSC	No limitation
2015 IBC §407.4.4.3	Up to 2
2018 IBC §407.4.4.3	Up to 2

• 2015 and 2018 IBC limit by "passage through more than 3 doors"

\*Travel distance to exit access corridor must be met

Non-Sleeping Suites: Intervening Rooms

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Non-Sleeping Suites: Number of Exit Access Doors

CODE	SUITE LARGER THAN 2,500 SQ FT	SUITE LESS THAN 2,500 SQ FT
2012 LSC §18.2.5.7.3.2	2*	1
2015 IBC §407.4.4.6.2	2*	1
2018 IBC §407.4.4.6.2	2*	1

\* Doors must be remote

- For 2 MOE:
  - 1 MOE direct to corridor
  - Other can be to adjacent suite

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Non-Sleeping Suites: Travel Distance

CODE	MAX DISTANCE TO EXIT ACCESS	MAX DISTANCE TO EXIT
2012 LSC §18.2.5.7.3.4	100 ft	200 ft
2012 IBC §407.4.3.3-4, Table 1016.2	100 ft: ≤1 intervening room 50 ft: 2 intervening rooms	200 ft
2015 IBC §407.4.4.3, Table 1017.2	100 ft: passage through ≤3 doors 125 ft w/SD system	200 ft
2018 IBC §407.4.4.3, Table 1017.2	100 ft: passage through ≤3 doors 125 ft w/SD system	200 ft

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Non-Sleeping Suites: Maximum Size

CODE	MAX SIZE (SQ FT)
2012 LSC §18.2.5.7.3.3	10,000
2012 IBC §407.4.3.6.1	10,000
2015 IBC §407.4.4.6.1	12,500 15,000 w/SD system
2018 IBC §407.4.4.6.1	12,500 15,000 w/SD system

- Increase to 12,500 sq ft not permitted until 2015 editions
  - Need to meet most restrictive code

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# Smoke Compartments

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Smoke Barriers — Health Care

- Area limits
  - 2012 NFPA 101 and 2012 IBC – 22,500 sq. ft.
  - 2015 NFPA 101 – 22,500 sq. ft.
  - 2015 IBC – hospitals with single beds – 40,000 sq. ft.
  - 2018 NFPA 101 and 2018 IBC – hospitals with single beds – 40,000 sq. ft.
- Smoke barrier doors
  - NFPA 101, 2015 IBC and 2018 IBC – doors need not be 20 minute fire doors

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Smoke Barriers

- Dampers
  - 2012, 2015, 2018 NFPA 101 – smoke dampers not required with quick response sprinklers and fully ducted system
  - 2012 IBC – smoke damper required
  - 2015 and 2018 IBC – smoke dampers not required in hospitals with quick response sprinklers and fully ducted system

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# Corridor Walls

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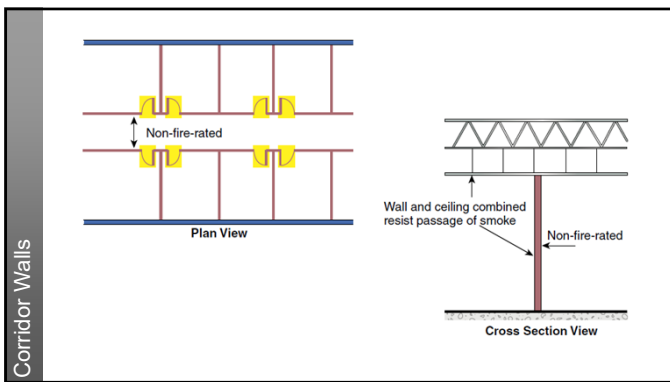
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Corridor Walls

- What is a ceiling that is capable of resisting the passage of smoke?
  - NFPA 101, A.18.3.6.2 - An architectural, exposed, suspended-grid acoustical tile ceiling with penetrating items, such as sprinkler piping and sprinklers; ducted HVAC supply and return-air diffusers; speakers; and recessed lighting fixtures, **is capable of limiting the transfer of smoke.**
  - IBC
    - Commentary language indicates that lay-in acoustical tile is **NOT** capable of resisting the passage of smoke
    - Code changes to specifically state that certain ceiling tile are capable of resisting the passage of smoke
      - IBC - Disapproved
      - IFC - Approved

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# Exit Discharge

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Exit Discharge

- NFPA 101
  - "...the interior exit discharge shall lead to a free and unobstructed way to the exterior of the building, and such way shall be readily visible and identifiable from the point of discharge from the exit."
- IBC – 2015 and 2018
  - "...and such exit is readily visible and identifiable from the point of termination of the enclosure."

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# Smoke Barriers

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- Are smoke barriers required in a separated occupancy on the same floor as a health care occupancy?
  - NFPA 101, 2012 – 18.3.7.2 (2)
    - "Areas that do not contain a health care occupancy and that are separated from the health care occupancy by a fire barrier complying with 7.2.4.3
    - Paragraph 7.2.4.3 defines the fire barrier used as a horizontal exit
  - IBC 2015 and 2018 – 407.5
    - "Smoke barriers shall be provided to subdivide every story used by persons receiving care, treatment or sleeping and to divide other stories with an occupant load of 50 or more persons, into no fewer than two smoke compartments."

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Changes Between 2012 and 2015 Editions of NFPA 101

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- Non-sleeping suites
- Exit enclosures
  - "Vestibules that separate normally unoccupied spaces from an exit enclosure shall be permitted, provided the vestibule is separated from adjacent spaces by corridor walls and related opening protectives as required for the occupancy involved but not less than a smoke partition in accordance with Section 8.4.
- Occupant load factor for AHC – 150 persons/sq. ft.
- Health care occupancy doors subject to locking are permitted to be disguised with murals.

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Reference Standards

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- Reference Standards
- NFPA 13 – 2016 Edition
    - New provisions dealing cloud ceilings
  - NFPA 72
    - 2013 Edition – New Chapter 7 on Documentation
    - 2016 Edition – Expanded material for risk analysis for MNS
  - NFPA 80 – 2016 Edition
    - New section of fire protective curtain assemblies
  - NFPA 105 – 2016 Edition
    - New section on smoke protective curtain assemblies

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- HVAC Control
- NFPA 90A
    - Smoke detectors for control of HVAC systems where
      - Systems where supply is greater than 2,000 cfm
      - Systems where return is greater than 15,000 cfm
  - IMC
    - Smoke detectors for control of HVAC systems where
      - Combined capacity of supply is greater than 2,000 cfm
      - Design capacity of return is greater than 2,000 cfm

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Smoke Control Stair Pressurization

- NFPA 92
  - Pressure difference of 0.5 in w.g. assuming sprinkler protection
  - Number of doors open considered by design professional
- IBC
  - "...not less than 0.10 inch of water (25 Pa) and not more than 0.35 inches of water (87 Pa) in the shaft relative to the building measured with all *interior exit stairway* and *ramp* doors closed under maximum anticipated conditions of stack effect and wind effect."

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AIA Learning Objectives

- 1** | OBJECTIVE Identify at least five significant differences between the IBC and NFPA 101 related to new health care occupancies.
- 2** | OBJECTIVE Identify at least three subtle differences between the IBC and NFPA 101 related to new health care occupancies.
- 3** | OBJECTIVE Identify at least three differences between NFPA 101 - 2012 and NFPA 101 - 2015 related to new health care occupancies.
- 4** | OBJECTIVE Identify at least three differences in the reference standards contained in NFPA 101-2012, NFPA 101-2015, and the IBC-2018.

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Questions



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**Thank you for your attention!**



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