Life Safety Code - 2012

Nursing Homes

Chip Carson, P.E.
Carson Associates Inc.
Fire Protection Engineers & Code Consultants
Warrenton, VA 20186
Topics

1. Door latches & locks
2. Projections into Corridor
3. Equipment in Corridor
4. Furniture in Corridors
5. Cooking Open to Corridors
6. Alcohol Hand-Rub Dispensers
7. Corridor Separation
8. Fireplaces
9. Smoke Barriers
10. Combustible Decorations
1. Door Latches & Locks
Locks, Latches & Alarm Devices [7.2.1.5]

- Doors readily opened from egress side when space occupied
- Locks not require key, tool, special knowledge or effort
Locks, Latches & Alarm Devices [7.2.1.5.10]

- Releasing device obvious under all lighting conditions
- > 34” to ≤ 48” high
- One releasing operation
Locks, Latches & Alarm Devices - General

- Doors from individual living units & guest rooms may have 1 additional operation
  - Existing may have 2 additional

- ≤ 60” high for existing
Locks, Latches & Alarm Devices cont’d

- Double cylinder key operated locks on exterior doors if:
  - Permitted
  - Lock status distinguishable
  - Sign
  - Key available
  - AHJ may revoke

[7.2.1.5.5]
Electrically Controlled Egress Doors [7.2.1.5.6]

- May be electrically locked w/built-in switch where:
  - Hardware affixed to door
  - Obvious method of operation
  - Operate w/ 1 hand in direction of egress
  - Loss of power unlocks
  - Listed per UL 294
Stairs Serving > 4 Stories

[7.2.1.5.8]

- Stairwell re-entry – 3 options:
  1. Each stair door permit re-entry, or
  2. All stair doors automatically unlock upon activation of fire alarm
  3. Selected door re-entry permitted if: ...
Stair Door Locking cont’d

- Re-entry available on ≥ 2 levels
- ≤ 4 floors intervening
- Re-entry on top or next to top floor
- Doors permitting re-entry identified
- Other doors provide direction to re-entry floors
Stair Door Locking – Option 3

Top floor, or next-to-top floor must allow reentry

No more than 4 floors intervening

Floors identified from stair side
Stair Door Locking  cont’d

- Stair door locking not applicable to
  - Existing installations not high-rise per Occupancy Chap.
  - Existing approved stair reentry
  - Buildings w/1 exit
  - Health Care per Chap. 18
  - Detention & Correctional per Chap. 22
Pairs of Doors in Egress
[7.2.1.5.11]

- Each door operate independently
- Doors w/ automatic flush bolts & no surface hardware
Locks, Padlocks, Etc.
[7.2.1.5.12]

- Not installed on doors requiring panic or fire exit hardware
- Special locking per 7.2.1.6
Special Locking Arrangements

- Delayed-Egress Locking [7.2.1.6.1]
- Access-Controlled Egress [7.2.1.6.2]
- Elevator Lobby Exit Access [7.2.1.6.3]
Delayed-Egress Locking

[7.2.1.6.1]

- Delayed egress permitted if:
  - Occupancy Chapter permits
  - Building w/ SAS or complete detection

![Image of a delayed egress device](image_url)
Delayed Egress Locks cont’d

• Unlocks upon SAS or detection activation
  □ 1 heat or 2 smoke detectors
• Unlock upon loss of power to lock mechanism
• Release w/in 15 seconds or 30 seconds per AHJ
• ≤ 15 lbf for ≤ 3 seconds to initiate
Delayed Egress Locks cont’d

• Unlocks upon activation of SAS or detection activation
  - 1 heat or 2 smoke detectors
• Unlock upon loss of power to lock mechanism
• Release w/in 15 seconds or 30 seconds per AHJ
• ≤ 15 lbf for ≤ 3 seconds to initiate
Delayed Egress Locks  cont’d

- Manual relocking
- Local alarm
- Instruction sign
  
PUSH UNTIL ALARM SOUNDS
  DOOR CAN BE OPENED IN 15 SECONDS

- Emergency lighting at door
Access Controlled Doors
[7.2.1.6.2]

- Entrance & egress access control permitted if:
  - Occupancy Chapter permits
  - Door unlocks w/ motion sensor
  - Door unlocks upon loss of power
    - Sensor
    - System
Access Controlled Doors cont’d

• Door unlocks w/ manual release

• Manual release
  - 40 to 48 in. high
  - ≤ 5 ft from door
  - Identified “Push to Exit”
  - Directly interrupts power
Access Controlled Doors cont’d

- Door remains unlocked for $\geq 30$ seconds
- If provided, fire alarm or AS unlock doors & doors manually reset
Access Controlled Egress Door
cont’d
Elevator Lobby Exit Access
[7.2.1.6.3]

- Where permitted, elevator lobby doors may be electronically locked where:
  - Electronic switch is listed per UL294
  - Building fire alarm system
  - Building AS
  - Elevator lobby w/smoke detection
  - Etc. ........
Elevator Lobby Exit Access
cont’d
Panic & Fire Exit Hardware

[7.2.1.7]
Panic Hardware

- Where required:
  Assembly, Educational, & Day Care where door serves area \( w/ > 100 \); & high hazard \( w/ > 5 \)
  - Bar extend \( \geq \frac{1}{2} \) width of door
  - Release in direction of egress
Panic Hardware cont’d

• Push bar 34 - 48 in. high & ≤ 15 lbf to activate
  ▪ Existing ≥ 30” to ≤ 48” high
• Panic hardware for non-fire doors
• Fire exit hardware for fire doors
• No locking device
Door Locking

- Locks not permitted on patient sleeping rooms unless 1 of following [18/19.2.2.2.2]:
  - Key-lock to restrict access from corridor but operable from inside
  - Locks per 19.2.2.2.5

(Will address)
Door Locking cont’d

- Doors in egress not have lock or latch that requires key or tool from egress side unless [18/19.2.2.2.4]:
  1. Locks per 18/19.2.2.2.5
  2. Delayed egress locks per 7.2.1.6.1
  3. Access-controlled egress doors per 7.2.1.6.2
Door Locking cont’d

- Doors in egress not have lock or latch that requires key or tool from egress side unless cont’d........

4. Elevator locking per 7.2.1.6.3
5. Approved existing door locking
(1) 18/19.2.2.5

- Where patient special needs require specialized security measures provided all of following:
  1. Staff can readily unlock doors at all times per 18/19.2.2.6
  2. Total smoke detection throughout locked space or, doors remotely unlocked from constantly attended location w/in locked space  
   cont’d
3. Building protected throughout w/SAS

4. Locks are electric locks that fail safely (fail unlocked) upon loss of power

5. Locks release by each:
   a) Activation of smoke detection
   b) Sprinkler water flow
(2) Delayed-Egress Locking

[7.2.1.6.1]
• NFPA 101 – 2000 had a limit of 1 delayed-egress lock per egress path
  □ Limitation now removed
(3) Access Controlled Doors

[7.2.1.6.2]
(4) Elevator Lobby Exit Access
cont’d
(5) Approved Existing

- Not code required, but documentation is probably needed to document previously approved.
Self-Closing Devices [7.2.1.8]
Self-Closing Devices  cont’d

- Doors intended to be closed:
  - Not held-open at any time
  - To be self-closing
  - Automatic closing if: ....
Auto-Closing Devices

- Low or ordinary hazard or high hazard w/ AHJ approval
- Door becomes self-closing
- Door w/ manual release
Auto-Closing Devices cont’d

• Smoke detection activates release
  ▶ Full area detection, OR
  ▶ Smoke detection at door
• Detection supervised
• Smoke detection release of any stair door causes all doors in stair to close
Smoke detection release of any stair door causes all doors in stair to close.
Power Operated Doors [7.2.1.9]

- When in required means of egress:
  - Permit egress upon loss of power
  - Force to set in motion $\leq 50$ lbf
  - Swing in direction of egress at any point in slide
  - Sign required
Powered Operated Doors cont’d

- When serving < 50, may slide
- Opening in breakout mode of 2-leaf door may be ≥ 30” per leaf
- Bi-parting sliding doors ≥ 32” clear w/ both leafs in break-away mode
- Doors per 7.2.1.14
Powered Operated Doors Required to be Self-Closing

- Doors can be opened manually
- Doors normally closed
- New doors remain open ≤ 30 seconds
- Doors held-open close by smoke detector activation
- Doors required to latch do so
- New per BHMA A156.19
2. Projections into Corridor
Corridor Width
[18/19.2.3.4]

- Minimum width of aisles, corridors and ramps
  - (New) ≥ 8 ft.
  - (Existing) ≥ 4 ft.
  - Unless ……
  - Adjunct areas w/o patients may be 44”
Remember, 7.3.2.2 permits projections up to 4-1/2” on both sides at 38” and below.

8 ft. clear

≤ 38”
Corridor Width - Projections

(1) Aisles, corridors, & ramps in adjunct areas not used for housing, treatment, or use of inpatients may be ≥ 44”

For example, office areas, maintenance areas, back-of-house areas
Corridor Width - Projections

(2) Non-continuous projections ≤ 6” from wall and above handrail height (38”) permitted

Examples include nurse charting units, wall-mounted computers, telephones, fire alarm boxes, etc.
Corridor Width - Projections cont’d

(3) Exit access within suites
4. Equipment in Corridors
(4) Projections for wheeled equipment where:

a) Does not reduce clear width to < 60”

b) Emergency plan addresses relocation of wheeled equipment

c) Wheeled equipment limited to
   - Equipment in use
   - Medical emergency equipment
   - Patient lift & transport equipment
5. Furniture in Corridors

[18/19.2.3.4 (5)]
Furniture in Corridors cont’d

(5) Projections for fixed furniture where:

• Corridor $\geq$ 8 ft wide
• Furniture secured to wall or floor
• Furniture does not reduce width to < 6 ft.
• Located on one side of corridor

cont’d ……..
(5) cont’d…

- Each grouping $\leq 50\ \text{ft}^2$
- Groupings separated by $\geq 10\ \text{ft}$.
- Does not obstruct building service or fire protection equipment

cont’d ………
Furniture in Corridors cont’d

(5) cont’d….

• Smoke detectors in corridors of smoke compartment or have direct supervision by staff
• QRS throughout smoke compartment
Door Width – New [18.2.3.6]

- Hospitals & Nursing Homes – 41.5”
- Psychiatric & Limited Care – 32”
- \( \geq 32” \) where no health care occupants
- \textit{Stair doors} \( \geq 32” \)
- \textit{Newborn nurseries} \( \geq 32” \)
- \textit{Pair of doors,} \( \geq 1 \) to be \( \geq 32” \)
Door Width \[18/19.2.9\]

41.5"
Door Width  cont’d

- 41.5” door width not required where:
  - Doors not subject to any health care occupant ≥ 32”
  - Doors to exit stairs ≥ 32”
  - Where pair of doors:
5. Cooking Open To Corridors
[18/19.3.2.5.3]
Cooking Facilities [18/19.3.2.5]

- Cooking facilities protected per 9.2.3
  - Section 9.2.3 requires compliance with NFPA 96, *Standard for Ventilation Control & Fire Protection of Commercial Cooking Operations*
Where residential cooking equipment is used for food warming or limited cooking, no protection required & not considered a hazardous area.
Cooking Facilities  cont’d
[18/19.3.2.5.2]

Annex note references small appliances such as microwave ovens, hot plates, toasters, & nourishment centers
Cooking

- May be open to corridor per 18/19.3.2.5.3
Cooking [18/19.3.2.5.3]

- W/in smoke compartment where cooking for $\leq 30$ persons, 1 cooking facility may be open to the corridor where:
  1. $\leq 30$ beds & separated by smoke barrier
  2. Range hood at least as wide as cooking surface
  3. Hood system w/air flow 500 cfm
Cooking cont’d

4. Hood systems not ducted to exterior to have charcoal filters

5. Cooktop range have:
   - Fire suppression system per UL 300 or UL 300A
   - Manual release for extinguishing system
   - Interlock to turn off all sources of power under hood
Cooking cont’d

6. Solid fuel cooking prohibited
7. Deep-fat frying prohibited
8. Portable fire extinguishers per NFPA 96 – Class K w/in 30 ft of cooking surface
9. Switch to turn off power
   - Locked or restricted access
   - Deactivate cooking unit when not under staff supervision
   - 120 minute timer
Cooking cont’d

10. Procedures for use, inspection, testing, & maintenance per NFPA 96

11. ≥ 2 AC powered photoelectric smoke alarms w/silence feature in area not closer than 20 ft from cooking surface
Cooking

(separated by corridor walls)

[18/19.3.2.5.4]

- W/in smoke compartment:
  - Residential or commercial cooking equipment
  - Used for preparing meals for \( \leq 30 \)
  - Space w/cooking not a patient room
  - Space separated by corridor wall
Cooking cont’d
(separated by corridor walls)

- Requirements of 18/19.3.2.5.3(1) – (10) are met (previously covered)
- Transfer grilles not permitted
Cooking in Rooms
(separated by corridor walls)

- Walls limit transfer of smoke
- Compliance with NFPA 80 not required
- Clearance at bottom of door ≤ 1”
- Positive latching
- Dutch doors permitted provided:
  - Both leafs latch
  - Meeting edges have astragal, rabbet, or bevel
Cooking
[18/19.3.2.5.4]

- Where cooking protected per NFPA 96 (e.g. cooking for > than 30):
  - Room or space not considered a hazardous area per the _ 3.2 section
  - Space may not be open to corridor
6. Alcohol-Based Hand-rub Dispensers
[18/19.3.2.6]
Alcohol-Based Hand-rub Dispensers

(1) Corridor \( \geq 6 \text{ ft.} \)
(2) \( \leq 1.2\text{L} \) (0.32 gal) in rooms, corridors, areas open to corridors
   \( \leq 2 \text{L} \) (0.53 gal) in suites
(3) Aerosol containers \( \leq 18 \text{ ozs.} \) & be limited to Level 1 aerosols
(4) Separated by \( \geq 4 \text{ ft.} \)
Alcohol-Based Hand-rub Dispensers cont’d

(5) ≤ 37.8 L (10 gals) or 1135 ozs. (32.2 kg) of Level 1 aerosols outside of cabinets in any smoke compartment

(6) 1 dispenser per 18/19.3.2.6(2) or (3) per room not included in aggregate quantity
Alcohol-Based Hand-rub Dispensers cont’d

(7) Storage > 18.9L (5 gal) in any 1 smoke compartment to be per NFPA 30

(8) Dispensers not installed:
   - above ignition source .. ≥ 1”
   - to side of ignition source ≥ 1”
   - beneath ignition source .. ≥ 1”
Alcohol-Based Hand-rub Dispensers cont’d

(9) Dispensers over carpet only permitted in smoke compartments w/AS

(10) Solution $\leq 95\%$ alcohol

(11) Operation of device regulated (6 rules)
7. Corridor Separation
Corridors – New & Existing

[18/19.3.6]

- Corridors separated from all use areas, unless:
  1) Unlimited size areas not used for patient sleeping, treatment, or hazardous area
  2) Waiting areas \( \leq 600 \text{ sq.ft} \)
  3) Nurses stations
  4) Gift Shop (existing w/ AS in SC or gift shop)
  5) Limited Care, group meeting spaces
  6) Cooking facilities per 18/19.3.2.5.3
Corridors – Existing cont’d

7) Spaces other than patient sleeping, treatment, or hazardous area:
   • Smoke Detection in SC
   • AS or control combustibility of contents

8) Waiting spaces ≤ 600 sq.ft:
   • SD in area

9) Group meeting or multipurpose therapeutic spaces under continuous supervision
Spaces Open to Corridor

- Quick Response Sprinkler
- Standard Response Sprinkler

Waiting Area

Smoke Barrier

Nurses Station
Nurses Station open to corridor
Corridor Wall Construction

- Corridor wall if not sprinklered
- Corridor wall if sprinklered
- Architectural tile ceiling w/ ducted return
Corridor Door

Door resist passage of smoke
- No rating required
- Does not have to comply with NFPA 80

Glazing unlimited size

Latch hardware

Kick plate - unlimited
Dutch Doors  [18/19.2.6.3.11]

- Top half must latch into bottom half
- Meeting edge protected w/astragal, rabbet, or bevel
Fire rated door limited to 16” by NFPA 80, unless listed

Non-fire rated door unlimited by 18/19.3.6.3.10 (Was limited to 48”)

Kick plates
Fire rated
door limited
to 16” by
NFPA 80,
unless listed
8. Fireplaces [18/19.5.2.3(2)]
Fireplaces cont’d

- Direct-vent fireplaces as defined in NFPA 54, *National Fuel Gas Code*
Fireplaces cont’d

- Not inside patient room
- SAS with QRS or residential sprinklers
- Sealed glass front with wire mesh panel or screen
- Controls locked or in secure location
- CO detection in room
9. “Smoke Barriers”

Subdivision of Building Spaces

[18/19.3.7]

- Buildings housing Health Care to be subdivided by smoke barriers as follows:
Smoke Barriers - New cont’d

- Divide every story used for sleeping or treatment
- Divide every story w/ ≥ 50 persons
- Limit size to ≤ 22,500 sq.ft.
- Limit travel distance from any point to smoke barrier door to ≤ 200 ft.
Smoke Barriers

Smoke Barrier

Nurses Station
This part of wall serves as smoke barrier & corridor wall.
Smoke Barriers cont’d

- 1 hr. fire resistance (Existing \( \frac{1}{2} \) hr)
- Penetrations sealed
- Limit size of smoke compartment to 22,500 ft\(^2\)
- Limit travel distance to smoke barrier door to \( \leq 200 \) ft.
Smoke Barrier Doors

- Doors ".. substantial doors, such as 1\(\frac{3}{4}\)" thick, solid-bonded wood-core doors, or shall be of construction that resists fire for a minimum of 20 minutes, .."
- New to have a pair of doors
- Doors 41-1/2" (existing 32")
Smoke Barrier Doors cont’d

- Clearance under bottom of door ≤ \( \frac{3}{4}'' \)
- Self-closing or automatic closing
- Latching hardware not required
- Stops required
- New: Clearance under door ≤ \( \frac{3}{4}'' \)
- New: rabbets, bevels, or astragals
Rabbets, Bevels, Astragals
Smoke damper unless quick response sprinklers in both adjacent smoke compartments

Doors not required to:
- Be rated
- To have a latch

Be careful of locks... see 18/19.2.2.5
Subdivision of Building Spaces – EXISTING [19.3.7]

- Buildings housing Health Care to be subdivided by smoke barriers as follows:
Smoke Barriers cont’d

• Divide every story used for sleeping for > 30 patients
• Limit size to ≤ 22,500 sq.ft.
• Limit travel distance from any point to smoke barrier door to ≤ 200 ft.
$\frac{1}{2}$ hr for existing
10. Combustible Decorations

Draperies, curtains, & other loosely hanging fabrics and films to meet requirements of NFPA 701, *Standard Methods of Tests for Flame Propagation of Textiles and Films*

cont’d ………
Combustible Decorations cont’d

• Does not include:
  - Shower curtains
  - Curtains within patient rooms
  - Curtains in other rooms where \( \leq 48 \text{ ft}^2 \) and \( \leq 20\% \) of area of wall on which mounted
Combustible Decorations  cont’d

- Combustible decorations prohibited unless:
  - Flame-retardant or treated with approved fire-retardant
  - Meet NFPA 701
  - Exhibit heat release rate $\leq 100$ kW
  - Photos, artwork, paintings attached to walls
Combustible Decorations  cont’d

• Photos, artwork, paintings attached to walls and ceiling and:
  - ≤ 20% of wall or ceiling area inside any room in smoke compartment w/o sprinklers
  - ≤ 30% of wall or ceiling area inside any room in smoke compartment w sprinklers
Combustible Decorations cont’d

• Photos, artwork, paintings attached to walls and ceiling and:
  - ≤ 50% of wall or ceiling area inside any patient sleeping room w/ ≤ 4 persons in smoke compartment w/o sprinklers
End