Means of Egress Doors and Special Locking Arrangements

Presented by
Joseph Versteeg, Building and Fire Code Consultant

Office of Education and Data Management
Spring 2017 Career Development Series

Overview

This presentation will provide an overview of the requirements for the design, construction and installation of doors, hardware, locks and locking systems used as part of the means of egress in buildings. Topics will include door operations, delayed egress, access-controlled electromagnetic locks, stairway doors, panic and fire exit hardware.
Means of Egress Doors & Special Locking
ODEM Spring 2017 Career Development Series

Agenda

- New & existing doors
- Hardware
- Accessibility
- Fire doors
- ITM

Regulatory Documents

Effective October 1, 2016

[Images of regulatory documents]

Regulatory Documents

Effective October 1, 2016

[Images of regulatory documents]
Basics

Means of egress doors shall meet the requirements of this section. Doors serving a means of egress system shall meet the requirements of this section and Section 1020.2.

Doors provided for egress purposes in numbers greater than required by this code shall meet the requirements of this section.

Basics

Means of egress doors shall be readily distinguishable from the adjacent construction and finishes such that the doors are easily recognizable as doors. Mirrors or similar reflecting materials shall not be used on means of egress doors. Means of egress doors shall not be concealed by curtains, drapes, decorations or similar materials.
**Means of Egress Doors & Special Locking**

**ODEM Spring 2017 Career Development Series**

---

**Mirrors**

- New > 32" CW
- Existing > 28" DW
- Lesser permitted
- Wider required

---

**Door Leaf Width - maximum**

---

**Door Width - minimum**
Door Width

Pair – single opening

Door Width

Pair – multiple openings

Door Width

Pair – multiple openings
**Wider Doors**

- **I-2 Healthcare**
  - > 41 ½”

**Narrower Doors**

- **I-3 Detention**
  - > 28”

**Narrower Doors**

- Storage closets
  - < 10 sq. ft.
  - No minimum
Narrower Doors

Interior doors in units not required to be accessible

Other than R-1

\[ \geq 31 \frac{3}{4}'' \]

B & B

\[ \geq 28'' \]

\[ \geq 24'' \] bathrooms

Means of Egress v. Escape

Projections
Headroom

80” new
78” w/in residential
76” exterior residential
(non-exit)
72” existing w/ padding

Door Swing Direction

Direction of egress travel
• > 50 people
• Exit stair enclosure – other than living units
• High hazard
• Horizontal exit

Door Leaf Encroachment

"X" = minimum required width
**Door Leaf Encroachment**

- $\frac{1}{2}$ required width
- 7” Max

**Opening Forces**

- Release latch < 15 lbs
- Set door in motion < 30 lbs
- Fully open door < 15 lbs
  ($< 50$ lbs for existing doors)
- Breakaway door < 50 lbs

**Opening Forces**

- Interior swinging
- Non-fire doors
- $\leq 5$ lbs
Floor Level - landings

- Existing
- OL < 50
- Top of stair only
- Direction of travel

Thresholds

Figure 1909.1.5 DOOR LANDINGS
Maneuvering Clearances

24” min

(a) Front Approach, Pull Side

Door Surface

Doors in Series
Doors in Series

Man-Trap

Door Locking

- Doors readily opened from egress side when space occupied
- Locks not require key, tool, special knowledge or effort

Obvious Method of Release
Obvious Method of Release

Tight Grasping

...tight grasping, pinching, or twisting of the wrist

Key-Operated

A (OL ≤ 300), B, F, M, S, & religious worship
Releasing Operations

Inside Residential units & existing conditions (OL ≤ 3)

Panic/Fire Exit Hardware

A & E w/ OL ≥ 50
A, E, & DC OL > 100
Group H
UL 305 panic
UL 305 & UL 10C – fire exit hardware
Delayed Egress

Prohibited in A, E, & H

Alarmed Egress

Access Controlled

A, B, E, I-2, M, R-1, & R-2
Electromagnetically locked

A, B, E, I-2, M, R-1, & R-2

Patient Room Doors

• Locks prohibited, unless
  - Corridor side
  - Staff has keys
  - Occupant can egress

Correctional Facilities

New

• Manual means
• And one other method
  - Remote unlocking
  - Sprinklers
  - Manual alarm box
Clinical or Security Needs

I-1 & I-2

- Remote unlocking
- Smoke detection
- Sprinklers
- Fail-safe electric locks
- Staff carry keys, codes, etc.
- Emergency plan

Stairwell Re-entry

Door Swing Alternatives

B, F, M, & S
Door Swing Alternatives

Horizontal Sliding Door

Door Swing Alternatives

Manual sliding

Door Swing Alternatives

Manual sliding
Door Swing Alternatives

Revolving Door

Door Swing Alternatives

Revolving Door

Door Swing Alternatives

Healthcare
Door Swing Alternatives

**Powered Doors**

Door Swing Alternatives

**Turnstiles**

Door Swing Alternatives

**Turnstiles ?**
Means of Egress Doors & Special Locking
ODEM Spring 2017 Career Development Series

Opening Protection

<table>
<thead>
<tr>
<th>Type of Assembly</th>
<th>Required Wall Assembly Factor (RWA)</th>
<th>Door View Panel A 10' or Less</th>
<th>Door View Panel A 10' or More</th>
<th>Sidelight or Transom Panels A &amp; C</th>
<th>Window Assemblies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free partitions</td>
<td>1.0</td>
<td>[0-00]</td>
<td>[0-00]</td>
<td>[0-HCR-40]</td>
<td>[0-60] or [1-60]</td>
</tr>
<tr>
<td>Contain walls</td>
<td>0.5</td>
<td>[0-00]</td>
<td>[0-00]</td>
<td>[0-HCR-35]</td>
<td>[0-60] or [1-60]</td>
</tr>
</tbody>
</table>

---

Opening Protection

<table>
<thead>
<tr>
<th>Table 703: Shading Fire-Rated Glazing Assemblies</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRE TEST STANDARD</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>ASTM E 119 or UL 263</td>
</tr>
<tr>
<td>NFPA 252 or UL 710</td>
</tr>
<tr>
<td>NFPA 252 or UL 710, HC</td>
</tr>
<tr>
<td>NFPA 252 or UL 710, HC</td>
</tr>
<tr>
<td>NFPA 252 or UL 710, HC</td>
</tr>
<tr>
<td>NFPA 252 or UL 710, HC</td>
</tr>
<tr>
<td>NFPA 252 or UL 710, HC</td>
</tr>
</tbody>
</table>

---

Opening Protection

(Amtd: Table 8.3.6.2 Minimum fire protection ratings for opening protectives in fire-resistance-rated assemblies)

<table>
<thead>
<tr>
<th>Component</th>
<th>Walls and Partitions (hr)</th>
<th>Fire Door Assemblies (hr)</th>
<th>Fire Window Assemblies (hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevator hoistway</td>
<td>2</td>
<td>1½</td>
<td>NP</td>
</tr>
<tr>
<td>Vertical shafts (excluding stairways, exits, and refuse chutes)</td>
<td>1</td>
<td>1½</td>
<td>NP</td>
</tr>
<tr>
<td>Fire barriers</td>
<td>2</td>
<td>1½</td>
<td>NP</td>
</tr>
<tr>
<td>Horizonal exits</td>
<td>2</td>
<td>1½</td>
<td>NP</td>
</tr>
<tr>
<td>Exit access corridors</td>
<td>1</td>
<td>1½</td>
<td>1/3</td>
</tr>
<tr>
<td>Smoke barriers</td>
<td>1</td>
<td>1½</td>
<td>NP</td>
</tr>
</tbody>
</table>
Fire Door Basics

NFPA 80

- Fabric fire safety curtains
- ITM dampers
- Door bottom clearance
- Floor fire doors
- Care & maintenance
- Glazing materials
- Fire shutters

Fire Doors

NFPA 80

- Visual & functional
- Annually
- Knowledgeable persons
- 11 specific items
- Written records
  - signed
  - kept for AHJ inspection
All Egress Doors

CFSC Part IV

- Visual & functional
- Occupancy driven
- Knowledgeable persons
- 11 specific items
- Written records
  - signed
  - kept for AHJ inspection

I Got Nothing

Questions or Comments
Thank You