DESIGN – BARRIERS – WHERE ARE THEY LOCATED, WHAT ARE THEY FOR?

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OBJECTIVE

• Identify the different types of barriers used in health care facilities
• Identify the key characteristics for each barrier
  ▪ Continuity
  ▪ Protection of openings
• List at least three strategies that can be used to improve a barrier management program
TYPES OF WALL ASSEMBLIES

• Exterior walls
• Fire walls
• Fire barriers
• Fire partitions – No such assembly in NFPA
• Smoke barriers
• Smoke partitions
• In accordance with ASTM E119/UL263
• Resist passage of heat and hot gases
• Structural integrity during the test fire
• Have something left at the end of the test
FIVE POINTS

- Required fire-resistance rating
- Continuity
- Openings and penetrations
- Types of materials
- Structural robustness
Fire barriers are used in the following applications:

- Fire area separations
- Mixed occupancy separations
- Incidental use areas
- Hazardous area separations
- Exit enclosures
- Shaft enclosures
- Horizontal exits
- Corridor walls – NFPA only
EXIT ENCLOSURE PENETRATIONS
FIRE BARRIERS – HORIZONTAL CONTINUITY

- Fire barrier to fire barrier
- Shaft enclosure
- Horizontal exit or smoke barrier
- Outside wall to outside wall
- Outside wall to Fire barrier
- Around hazardous area
- Exit enclosure
- Corridor enclosure
• Supported by construction with the same fire-resistance rating as the fire barrier
• Some exceptions
  ▪ Vary between NFPA and ICC
# SUMMARY OF FIRE BARRIERS

<table>
<thead>
<tr>
<th>Issue</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Fire-Resistance Rating</td>
<td>Depends upon specific use</td>
</tr>
<tr>
<td>Required continuity</td>
<td>Floor/ceiling below to deck above</td>
</tr>
<tr>
<td>Openings</td>
<td>General: Aggregate glazing area (or width) &lt;25% wall area/length; maximum size 120 sf. Specific: Rules based on use of barrier</td>
</tr>
<tr>
<td>Types of materials</td>
<td>As required for the type of construction</td>
</tr>
<tr>
<td>Robustness of structural system</td>
<td>If load bearing, fire tested with load</td>
</tr>
</tbody>
</table>
SUMMARY OF FIRE BARRIERS

- Fire damper
- Vision panel
- Ceiling
- Sealed
- Limit use of windows
- Fire protection rated door with closer
- Fire resistance rated
Fire partitions are used in the following applications:

- Dwelling units separations
- Sleeping units in Group R-1, R-2 and I-1
- Tenant separation in covered malls
- Exit access corridor walls
- Elevator lobby separation

Remember, NFPA does not use this phrase.
<table>
<thead>
<tr>
<th>Issue</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Fire-Resistance Rating</td>
<td>1 hour, with exceptions, depending on use. For corridors see Table in Chapter 10 – IBC only</td>
</tr>
<tr>
<td>Required continuity</td>
<td>Floor/ceiling below to deck above or tight to underside of fire-resistance rated assembly. Supported by fire-resistance rated construction, except in corridors, tenant, and guestroom separations in Types IIIB and VB construction</td>
</tr>
<tr>
<td>Openings</td>
<td>20 minutes (w/o hose stream) for corridors 45 minutes for all others</td>
</tr>
<tr>
<td>Types of materials</td>
<td>As required for the type of construction</td>
</tr>
<tr>
<td>Robustness of structural system</td>
<td>If load bearing, fire tested with load</td>
</tr>
</tbody>
</table>
• Smoke barriers are used in the following applications:
  ▪ Group I-2
  ▪ Group I-3
  ▪ Areas or refuge
  ▪ Other specific applications
## SUMMARY OF SMOKE BARRIERS

<table>
<thead>
<tr>
<th>Issue</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Fire-Resistance Rating</td>
<td>1-hour with the exception that a construction of a minimum 0.1” thick steel in Group I-3 buildings is allowed</td>
</tr>
<tr>
<td>Required continuity</td>
<td></td>
</tr>
<tr>
<td>Horizontal: Outside wall to outside wall</td>
<td></td>
</tr>
<tr>
<td>Vertical: Floor to slab or deck above, continuous through interstitial spaces</td>
<td>Supporting construction may be required based upon the applicable codes</td>
</tr>
<tr>
<td>Openings</td>
<td>20 minutes – but not a true fire door in NFPA 101 Smoke- and draft-controlled doors tested in accordance with UL 1784 – IBC only</td>
</tr>
<tr>
<td>Types of materials</td>
<td>As required for the type of construction</td>
</tr>
<tr>
<td>Robustness of structural system</td>
<td>If load bearing, fire tested with load</td>
</tr>
</tbody>
</table>
• Smoke partitions are used in the following applications:
  ▪ Corridor walls in Group I-2 – IBC only
  ▪ Sprinkler protected hazardous areas – NFPA
## SUMMARY OF SMOKE PARTITIONS

<table>
<thead>
<tr>
<th>Issue</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required Fire-Resistance Rating</strong></td>
<td>Not required (unless otherwise required)</td>
</tr>
<tr>
<td><strong>Floor/ceiling below to deck above or tight to underside of ceiling membrane in ceiling membrane designed to limit passage of smoke</strong></td>
<td>- Difference between NFPA/ICC for ceiling tiles</td>
</tr>
<tr>
<td><strong>Openings</strong></td>
<td>Windows: Sealed to resist free passage of smoke</td>
</tr>
<tr>
<td></td>
<td>Doors: No louvers</td>
</tr>
<tr>
<td></td>
<td>Air leakage rated (UL 1784) – IBC???</td>
</tr>
<tr>
<td></td>
<td>Self closing, or automatic closing by smoke detectors</td>
</tr>
<tr>
<td><strong>Types of materials</strong></td>
<td>As required for the type of construction</td>
</tr>
<tr>
<td><strong>Robustness of structural system</strong></td>
<td>If load bearing, fire tested with load</td>
</tr>
</tbody>
</table>
WHAT IS IT?

GLAZING MATERIALS
1541

Pilkington Pyrostop
60-101
CAT II
WOD-T-H-60
60 Minute
23 mm

UL

CLASSIFIED
US

North America does
WHAT IS IT?
A legend that clearly identifies features of fire safety
Areas of the building that are fully sprinklered (if the building is partially sprinklered)
Locations of all hazardous storage areas
Locations of all rated barriers
Locations of all smoke barriers
Suite boundaries, including the size of the identified suites—both sleeping (max 5,000 sq ft) and non-sleeping (max 10,000 sq ft)
Locations of designated smoke compartments
Locations of chutes and shafts
Any approved equivalencies or waivers
SUCCESSFUL STRATEGIES

• BUILD IT CORRECTLY
  - Thorough plan review process
  - Contractor qualifications
  - Commissioning systems and buildings
    o NFPA 3, NFPA 4, pending ICC std.
  - Complete documentation while contractor still on site
  - Use of certified inspectors or special inspectors
BUILD IT CORRECTLY!!
SUCCESSFUL STRATEGIES

• Make sure all rehabilitation work is done correctly
  ▪ Refer to previous slides

• Above ceiling work permits
  ▪ Means to identify “approved” individuals

• Proper identification
  ▪ Labels
  ▪ Marking
  ▪ Life Safety Drawings
• Visit [www.koffel.com](http://www.koffel.com) for links to a LinkedIn Life Safety Code Discussion Group

• NFPA
  - [www.NFPA.org/###](http://www.NFPA.org/###)

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QUESTIONS AND DISCUSSION