FIRE WALLS and Horizontal Membranes

NCN-SFPE

10-20-17
Agenda

• What are Fire Walls?
• Application in Seismic Zones
• Changes in the 2018 IBC
Agenda

• **FIRE WALLS (2015 IBBC)**

• **706.2 Structural Stability.** Fire walls shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. Fire walls designed and constructed in accordance with **NFPA 221** shall be deemed to comply with this section.
706.6. **Vertical Continuity.** Fire walls shall extend from the foundation to a termination point not less than 30 inches above both adjacent roofs.

**Exceptions:**
FIRE WALLS

Area Separation Wall

“Fire Wall” or “Fire Separation Wall”
Typical Construction
UL Design U336

3/4” Free Air Space

11 1/2”
• NFPA 221 (2015)

6.2.1. Fire walls shall be designed and constructed to remain stable after the collapse of the structure due to fire on either side of the wall.

6.2.2. Fire walls constructed in compliance with the requirements of Section 6.3, 6.4, or 6.5 shall be deemed to provide the required stability.
• NFPA 221

• 6.5 Double Fire Walls
  • 6.5.1. A double fire wall shall consist of two back-to-back walls.
  • 6.5.2. There shall be no connections, other than to the flashing, between the walls.
  • 6.5.3. Each fire wall shall be supported laterally by the building frame on its respective side and shall be independent of the fire wall and framing on the opposite side
• 2018 IBC
• 706.2 Structural Stability

- **Exception**: In Seismic Design Categories D through F, where double fire walls are used in accordance with NFPA 221, floor and roof sheathing not exceeding 3/4 in. thickness shall be permitted to be continuous through the wall assemblies of light frame construction.
<table>
<thead>
<tr>
<th>Fire Resistance Rating of each Wall (hr)</th>
<th>Equivalent to Single Wall (hr)</th>
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<tbody>
<tr>
<td>3</td>
<td>4</td>
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<tr>
<td>2</td>
<td>3</td>
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<td>1</td>
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</table>
What is the purpose of a ceiling membrane?
What are the USG solutions?
Other solutions
Why use a horizontal membrane

- Ceilings in corridor and stair soffits
- Contain fire to protect area above (Compartment)
Corridor Ceiling and Stair Soffit

- Primary purpose of corridors is to stop spread of smoke
- No storage or obstructions inside corridors
- Walls are fire rated
- Fire is occurring outside of the space
Corridor Ceiling and Stair Soffit

- Mechanical/Duct work above
- Save on material/labor costs
• Code Provision - 708.4 Exception 3 (2015 IBC)
Corridor Ceiling and Stair Soffit

- Code Provision - 708.4 Exception 3 (2015 IBC)

1 Hour U419
Corridor Ceiling and Stair Soffit

- Code Provision - 708.4 Exception 3 (2015 IBC)

System A

3 1/8"

System B

3 1/2"
Corridor Ceiling and Stair Soffit

- Code Provision - 708.4 Exception 3 (2015 IBC)
Section 708.4 Continuity Exception 3

- Where the *corridor* ceiling is constructed as required for the *corridor* walls, the walls shall be permitted to terminate at the upper membrane of such ceiling assembly.
Fire Rated Horizontal Membrane

- May contain combustible objects
- Walls are fire rated
- Fire is occurring inside of the space
- Ceiling is fire-rated
  - Direct contact with fire
Fire Rated Horizontal Membrane

For more information consult Progressive Engineering Report AER-09038 at p-e-i.com
Available 2 hour membranes

- USG
  - Shaft Wall system per AER-09038

- UL DesignNos. G586, K504 & K506

- Gypsum Association Membrane – GA 610
  - From UL Design No. L556
Design Nos. G586, K504 & K506

UL Certified Assemblies

- Proprietary
Design No. G586
1. Supporting Structure
2. Hanger Wire
3. Steel Framing Members
   - a. Main Runners
   - b. Cross Tees
   - c. Cross Channels
   - d. Wall Angle or Channel
4. Resilient Channels
   - a. Furring Channels
5. Gypsum Board
6. Finishing System
Design No. K506

2-Hr Rated Ceiling Assembly

Steel strap

Steel studs

RC-1 resilient channels 16" o.c.

5/8" USG Sheetrock® Brand Firecode C Core Panel (Type C)

5/8" USG Sheetrock® Brand Firecode C Core Panels (Type C)
2-Hr Duct Enclosure
Per Designs U415 & K506

2-Hr Duct Enclosure

- Duct
- 1" USG Sheetrock® Brand Gypsum Liner Panels
- Steel studs
- Steel strap
- Perimeter channel
- 5/8" USG Sheetrock® Brand Firecode C Core Gypsum Panels (Type X)
- RC-1 resilient channels 16" o.c.
- 5/8" USG Sheetrock® Brand Firecode C Core Panels (Type C)
- Corner bead
Gypsum Association – GA 610

• 2 hour UL fire test based on L556
• Not proprietary
• Typically accepted by all jurisdiction