

COURSE TITLE:

FBC Advanced Course #1118.0

Advanced FBC 7th Edition (2020) – The Five Walls of IBC, A Guide to Fire-Resistance & Fire Protection

Talking Points - pdf slide #:

1. Title
2. AIA information
3. Copyright
4. Learning Objectives
5. 5 Separate Walls with 5 Individual Uses
 1. Differentiate between the way walls were defined in the legacy codes and this code.
 2. Each wall, with the exception of the Smoke Partition wall, all require a fire rating - why?
 3. The origin of the Smoke Partition wall, how it landed in the code and why.
 4. Explain the fire “application” of the first four walls defining how as one descends the list the fire application lessens within its placement in the structure, meaning each “use” is different with each application.
6. Fire-Resistance Rating (slide build-outs, 1)
 1. Examine and explain the definition.
 2. Discuss the FPE explanation of heat transfer and ignition at 267 degrees F.
 3. Describe the history and background of why three different criteria listings.
7. Passive Redundancy (slide build-outs, 1)
 1. Explain this fundamental principle in containing fire and smoke migration throughout a structure during a fire.

2. Illustrate the need for two primary systems, passive and active, with the story of the MGM Vegas fire.
3. Describe the basic posture of the country relative to this principle; i.e., where it came from and how it is accepted in the current code development arena.
8. Opening Protectives (slide build-outs, 2)
 1. Examine and explain the definition.
 2. Pose the dilemma of why the opening protective does not have to be rated same as the wall.
9. Opening Protectives within Wall Assemblies
 1. Explain the layout of the table.
 2. Bring awareness to the fact that shutters are not rated the same as the wall assemblies they are placed in, in every case.
 3. Point out that Fire Walls and Fire Barrier walls cannot have opening protectives rated less than 45 minute, whereas the remaining walls on the table can potentially be rated as low as 20 minutes.
 4. Reaffirm the point of “descending the list” in lesser fire application use as this table demonstrates.
10. NFPA 252/UL 10B Furnace Configuration & Test (slide build-outs, 5)
 1. Explain what a neutral pressure test is.
 2. Discuss make -up air sources.
 3. Explain main test criteria of Flame-thru and Flash-thru
 4. Explain original sandbag structural integrity test
 5. History & origin of NFPA and UL and why both are required in Section 716, Opening Protectives.
11. Hose stream - required due to UL10B being a neutral positive test.
12. Self-explanatory
13. Self-explanatory
14. Illustration of previous slide’s points - explain water transfer and confirm what to look for in leakage.

15. Illustration of previous slide's points - explain water transfer and confirm what to look for in leakage.
16. Hose Stream
 1. The requirements of hose stream in NFPA 252 and UL10B much different than in our current model codes.
 2. The Fire Partition, Smoke Barrier walls have lesser fire application use since opening protectives without hose stream are allowed to be placed within them.
17. NFPA 252/Temp Rise Furnace Configuration & Test (slide build-outs, 5)
 1. Explain what a neutral pressure test is.
 2. Discuss make-up air sources.
 3. Explain main test criteria of heat transfer limitation at 450 degrees
 4. Discuss Section 7.6.5.5 where Temp Rise is required and when not.
18. ASTM E-119/UL 263 Furnace Config. & Test
 1. Explain what a neutral pressure test is.
 2. Discuss make -up air.
 3. Explain main test criteria of heat transfer limitation at 250 degrees.
19. Positive Pressure Test (slide build-outs, 7)
 1. Discuss make -up air.
 2. Explain what a positive pressure test is and the significance of the 40" neutral pressure plane.
 3. Give the history of how this change was made in the code and why.
20. Fire Walls (slide build-outs, 6)
 1. Examine the definition focusing on structural independence.
 2. Review fire ratings.
 3. Where and when openings are allowed.

4. Briefly review the where's and why's of the double wall Fire Wall concept.
21. Opening Protectives in Fire Walls
 1. Introduce the 156 sq ft rule with an explanation of how it appeared in the code.
 2. Review the original code change with an explanation of the sprinkler exception.
22. 156 sq ft test laboratory furnace.
23. An explanation of the 25% rule for openings in Fire Walls.
 1. A maximum measurement allowed to be open during a fire event assuming the opening protective will likely not close.
24. Opening Protectives in Fire Walls (slide build-outs, 1)
 1. An explanation of the main cause of swing doors in rated walls not closing.
25. Opening Protectives
 1. Become aware that opening protectives in walls are different than the walls themselves in three primary areas; hourly ratings, heat transmission and are not fixed solid but deployable.
 2. Discuss - unlike walls, opening protectives are deployable and placed in walls for the traffic and communication of building occupants throughout the structure.
26. Opening Protectives (slide build-outs, 1)
 1. Opening protectives are tested for flame-thru and flash-thru only. Full radiant heat transfer is allowed.
 2. Explain the UL 10B requirements by referencing back to the test furnace and the purpose of structural integrity of the assembly.
27. Heat Transfer (slide build-outs, 1)
 1. Explain the allowance for opening protectives to transfer 100% heat. No fuel loads placed in wall openings.
28. Example of the use of Fire Walls
 1. Describe the building as shown on the screen.

2. Bring awareness to a common challenge of holding down construction costs by incorporating combustible construction.
29. Construction Types (slide build-outs, 2)
 1. As illustrated on the slide, combustible construction materials reduce costs compared with non-combustible construction materials.
 2. Explain the challenge and purpose of reduced height and area allowances due to more combustible construction.
 30. Review of Chapter 5 guidelines for area allowances (slide build-outs, 2)
 1. For example, Type 1A construction is much easier to design to but more expensive.
 2. Discuss Section 706.1 regarding the code “give me” when it comes to putting multiple buildings under one roof by separating area limitations or portions of buildings with Fire Walls.
 31. The Use of Fire Walls
 1. Assuming the structure requires 2-hour Fire Walls, review the design challenge of being limited by opening protectives that are conventional swing doors.
 32. The Use of Wide-span Opening Protectives in Fire Walls (slide build-outs, 2)
 1. Discuss wide-span opening protectives as solutions to the challenge of small opening protected by swing doors since they can span larger openings and incorporate conventional egress.
 2. Review the illustrations on the slide and bring an awareness to the many options that come with a host of wide-span opening protectives. Side-coiling, side-sliding, side-accordion, vertical rolling and vertical fixed. All options offer conventional egress features.
 33. Example of Wide-span Opening Protectives in a Theater Application
 1. With a pointer, indicate the Fire Wall separations.

2. Review the approval discussion with the local fire department with regard to wide-span opening protectives replacing the proposed swing doors and mullions.
 3. Discuss the final conclusion regarding conventional swing doors and mullions as inferior to wide-span opening protectives with regard to egress in an Assembly occupancy.
34. Fire Barriers (slide build-outs, 5)
1. Examine the definition focusing on continuity.
 2. Review fire ratings.
 3. Discuss the basic difference between openings in Fire Walls and Fire Barrier walls.
 4. Bring an awareness to the use of Fire Barrier walls as the predominant rated construction of building components is all structures, i.e., shafts, occupancy separation, exit passage ways, horizontal exits, etc.
36. Openings in Fire Barrier walls
1. Discuss challenging code language as shown on the slide with reference to what has already been learned and discussed regarding the opening protective requirements.
 2. Introduce the concept of continuity in the rating of shaft walls. Pose the question, where is the 25% measured? From corner to corner of one wall or the continuous length of the aggregate value of all four walls comprising the shaft enclosure?
37. Code Commentary Answer to the Question in the Previous Slide
1. Review the commentary explanation and explain it was the same justification presented when the code change was submitted in a previous code cycle.
 2. Discuss the code change reasoning wherein the proponent suggested the change was needed so that every time this condition was presented for review and approval, he would not have to approve something that was an infraction of the 25% rule.

38. Graphic Illustration of the Information on the Previous Slides (slide build-outs, 3)

1. Review the three examples indicating the continuity of the rated Fire Barrier wall.
2. The code change was approved under an incorrect premise. As long as the rated construction of a Fire Barrier shaft wall is continuous, it is not measured from corner to corner of one particular wall section. Rather the rated wall construction is measured as an aggregate value of the entire length of the wall.
3. For example, no regulatory official would approve the language as it stands in Exception 2 and disregard the 25% rule in an interior exit stairway.

39. Interior Exit Stairway Openings

1. Review the directive as it relates to openings in interior exit stairways.
2. Explain that this code section is often interpreted incorrectly with the assumption openings are limited to 3'0" x 7'0" doors.
3. This directive does not mention the size of doors, it only refers to openings allowed are only those required for exit access. So why was this statement/directive added to the code? The next slide will explain.

40. Previous Slide Code Language Explained (build-outs, 1)

1. Prior to the 2003 edition of the IBC a trend was developing in the design community wherein architects were desiring to open required exit stair shafts with non-rated glazing. In order to curb the trend this language was added to the 2003 IBC and has carried over into the current edition of the FBC.
2. The purpose of the language was not to define the size of an egress door in the shaft wall but rather to prevent the use of glazing.

41. Fire Partitions (slide build-outs, 5)

1. Examine the definition.

2. Review fire ratings.
3. Discuss the reason for a 1/2-hour rating requirement.
3. Bring an awareness to the opening protective requirements with no provisions for 156 sq ft or the 25% rule.
4. Bring an awareness to the use of Fire Partition walls as corridor, elevator lobby, tenant space, and egress balconies separations.
42. Pointer to Opening Protective Requirements
43. Review the additional smoke & draft requirements for opening protectives in corridors and smoke barriers.
44. Reconfirm the difference between doors used in 45 minute are greater applications and doors used in 20 minute applications.
45. Smoke Barriers (slide build-outs, 5)
 1. Examine the definition.
 2. Review fire ratings.
 3. Emphasize the need for defend-in-place smoke mitigation requirements.
 3. Bring an awareness to the opening protective requirements with no provisions for 156 sq ft or the 25% rule.
 4. Bring an awareness to the use of Fire Barrier walls as as defend-in-place passive systems in I-2s and I-3s only.
46. Pointer to Opening Protective Requirements
47. Review the additional smoke & draft requirements for opening protectives in corridors and smoke barriers.
48. Smoke Partitions (slide build-outs, 5)
 1. Examine the definition.
 2. Emphasize this wall has no fire rating requirement.
 3. Emphasize the need for limiting the transfer or passage of smoke.
 3. Bring an awareness to the opening protective requirements with no provisions for 156 sq ft or the 25% rule.
 4. Explain that it was not in the original 2000 edition of the IBC but came into play in the 2003 IBC and carried over into the current

FBC. Further explain its purpose and how it was brought into the code.

5. Review its applications in corridor walls of I-2 occupancies, elevator lobbies and separation of sites of sleeping rooms in I-2 occupancies.
49. Pointer to Opening Protective Requirements
50. Review of the smoke & draft control door requirements and self or automatic closing door requirements for smoke control.