

Fire Resistive Construction Lab Applications

Fire Prevention

Megan Hall, PhD

mchall@berkeley.edu

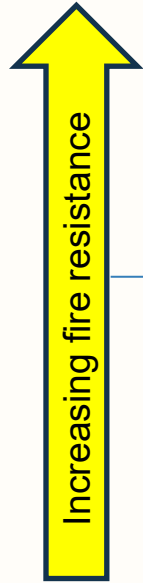
Deputy Fire Marshal - Hazardous Materials

Amy Chen

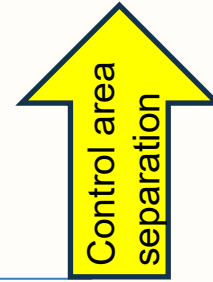
awchen@berkeley.edu

Campus Fire Marshal

Fire resistive construction



- Fire wall
- **Fire barrier**
- **Fire partition**
- Smoke barrier
- Smoke partition



Fire walls

- Create a complete separation in the building
- Creates separate buildings for code purposes of allowable area by construction type
- Designed so that collapse of the structure on either side doesn't collapse the fire wall
- Highest level of fire safety in the fire resistance rated wall types

Fire barriers

Create a separation for:

- Exits such as stair enclosures
- Shafts (e.g. mechanical, elevator)
- Occupancies (e.g. mixed occupancies)
- Incidental uses
- Atria
- Control areas and laboratory suites

Fire partitions

Creates a separation:

- Between dwelling units in R and I-1
- Tenant space walls in malls
- Enclosed elevator lobbies
- Corridor walls

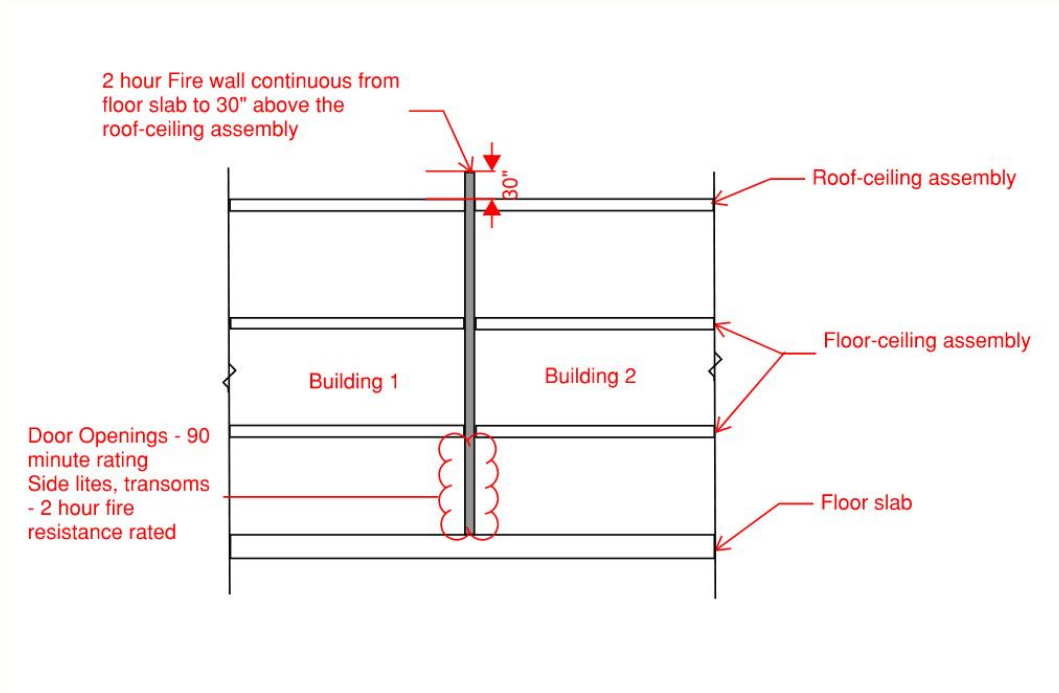
Smoke barriers

- Creates smoke compartments in smoke control systems
- Area of refuge separations
- Fire service access elevator lobby enclosures
- Smoke compartments in I-2 and I-3

Smoke partitions

- Pass through openings in I-2 condition 2

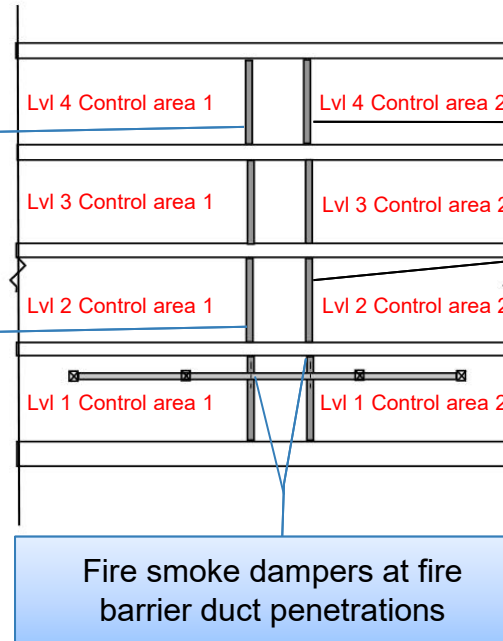
Fire walls



Fire barriers

Doors in 2 hour fire barriers for control areas – 90 min rated

Doors in 1 hour fire barriers for control areas – 45 min rated



On levels 4, 2 hour fire barrier separates control areas

On levels 1-3, 1 hour fire barrier separates control areas

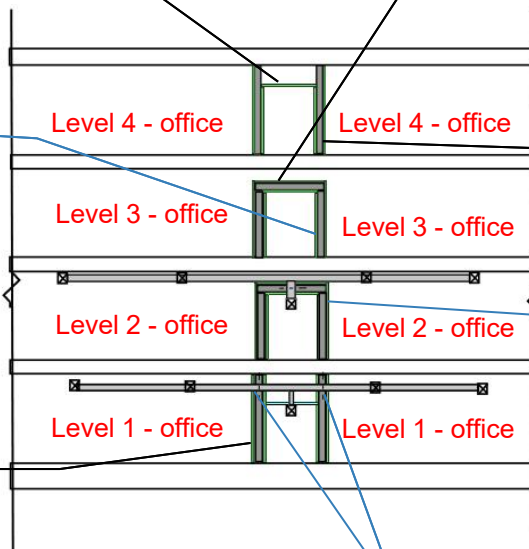
Fire smoke dampers at fire barrier duct penetrations

Fire partitions

Example of corridor construction where drywall extends to slab on room side and up to ceiling on corridor side

Doors in 1 hour fire partitions – 20 minute smoke & draft assembly

Example of corridor construction where fire partitions extend from slab to slab



Example of corridor construction where ceiling is constructed like the wall forming a 1 hour rated "tunnel".

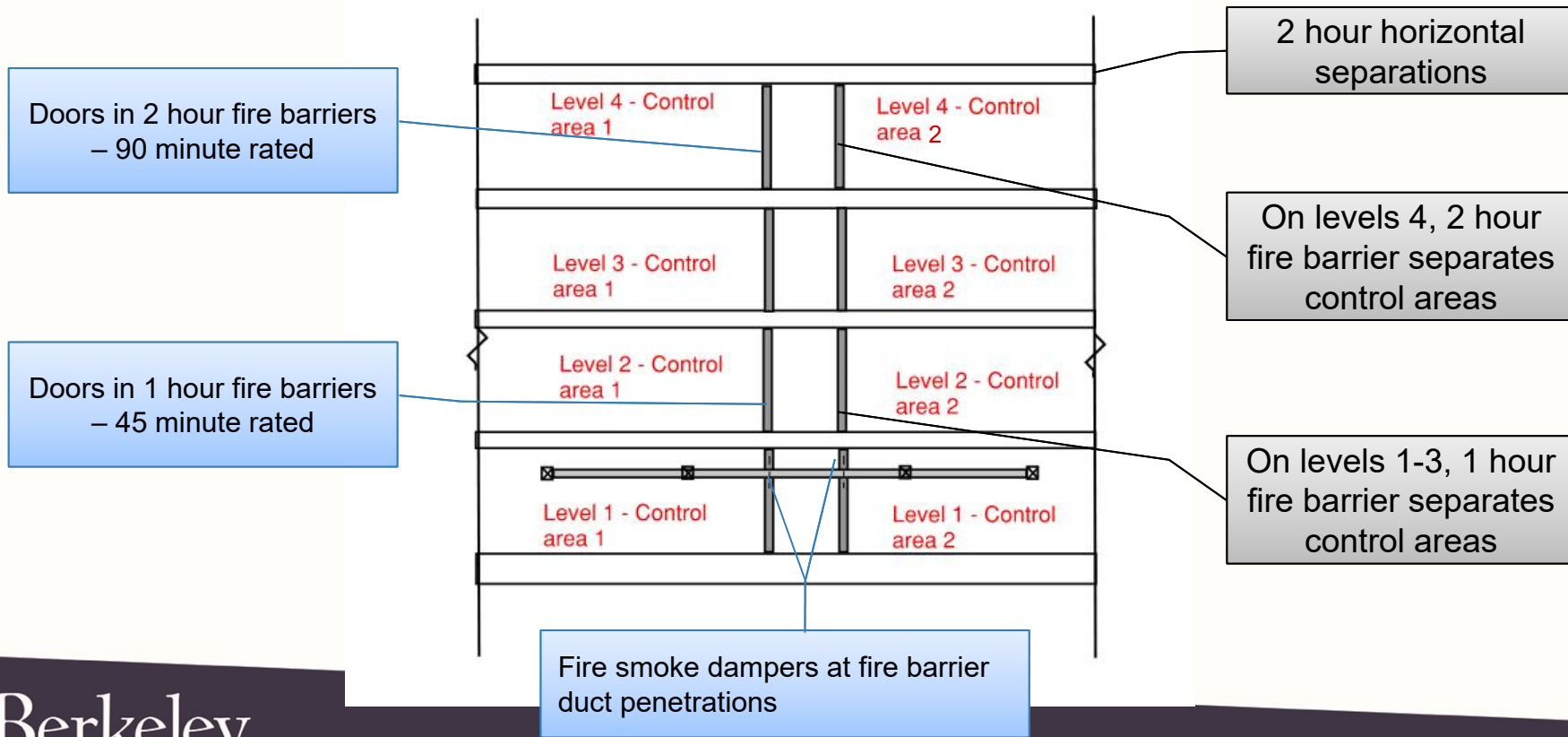
1 hour fire partitions at corridor walls

Fire smoke dampers at fire partition duct penetrations due to communicating openings in corridor and office.

Control areas – B labs

- Required ratings per CBC (2022) Table 414.2.2
- Horizontal separations are 2 hours (except in IIA, IIIA, IV and VA with sprinklers and 3 or fewer stories.
- Each portion of a building separated by fire walls is considered a separate building for number of control areas (2022 ed. CBC 414.2.3)

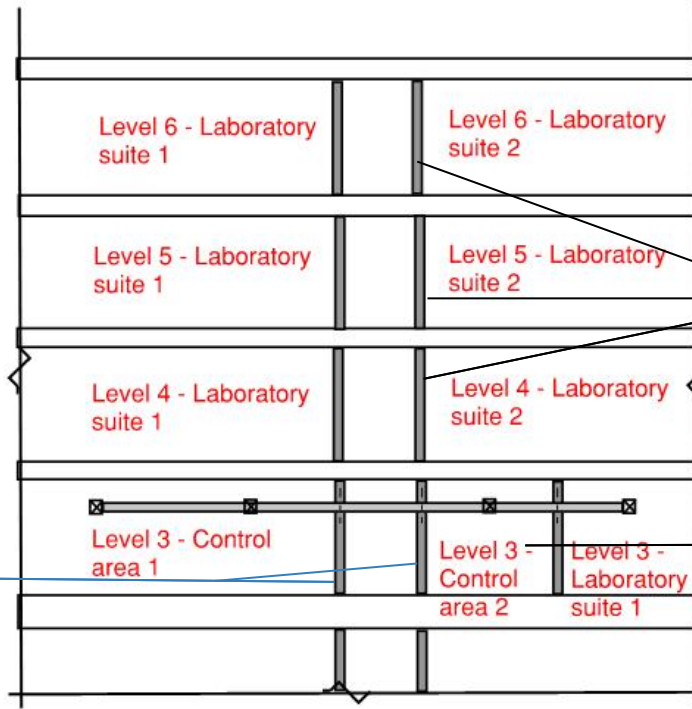
Lab applications – B Lab control area



Laboratory suites – L (H8) labs

- 1 hour fire barrier between L suites
- 2 hour fire barrier between L suites & B control areas (except 1 hour fire barrier on level 3 and below)
- 2 hour horizontal fire barrier between L suites (except for certain construction types {IIA, IIIA, VA})

Lab applications



2 hour horizontal separations throughout

On levels 4-6, 1 hour fire barrier separates laboratory suites

On levels 3 and below, 1 hour fire barrier separates laboratory suite and control area. Level 4 and above requires 2 hour fire barrier.

Doors in 1 hour fire barriers – 45 minute rated













Questions?