

## Chapter 6 Fire Walls

**6.1 Scope.** Fire walls shall meet the requirements of this chapter and Chapter 4 except as modified by this chapter.

### 6.2 Structural Stability.

**6.2.1** Fire walls shall be designed and constructed to remain stable after 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 Sections 6.3, 6.4, or 6.5 shall be deemed to provide the required stability.

**6.3° Cantilevered Fire Walls.** Cantilevered fire walls shall be entirely self-supported and nonbearing.

**6.3.1** There shall be no connections to the building(s) or contents on either side other than to the flashing.

**6.3.2** Such walls shall be erected where there is a complete break in the structural framework.

### 6.4° Tied Fire Walls.

**6.4.1 Placement.** Tied fire walls shall be centered on a single column line or constructed between a double column line.

#### 6.4.2 Framework.

**6.4.2.1** Structural framing on either side of the wall shall line up horizontally and vertically and shall support the roof.

**6.4.2.2** The framework on each side of the fire wall shall be continuous or tied together through the wall.

**6.4.2.3** The framework on each side shall be designed so that it resists the maximum lateral pull that can be developed due to framework collapse in a fire on the opposite side.

**6.4.2.4** Tied fire walls shall be supported laterally by the building framework with flexible anchors.

#### 6.4.3 Fire Resistance Rating.

**6.4.3.1** Where centered on a single column line, structural framing at the column line shall have a fire resistance rating of not less than the required fire resistance rating of the fire wall.

**6.4.3.2** Where the wall is installed between double column lines, framing along the first column line immediately on each side of the fire wall shall have a fire resistance rating of not less than the required fire resistance rating of the fire wall.

### 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.

**6.6 Fire Wall Termination.** Fire walls shall extend from the foundation to a point at least 30 in. (760 mm) above the surface of the roof except where installed in accordance with 6.6.1 through 6.6.4.

**6.6.1 Buildings Located Above Parking Garages.** A building located above a parking garage shall be permitted to have the fire walls for the building located above the parking garage extend from the horizontal separation between the parking

garage and the building, provided all of the following conditions are met:

- (1) The horizontal separation between the parking garage and the building above shall have a minimum 3-hour fire resistance rating.
- (2) The basement or first story above grade plane shall be of Type I construction.
- (3) Shaft, stairway, ramp, or escalator enclosures through the horizontal assembly shall comply with either of the following conditions:
  - (a) The enclosure shall have not less than a 2-hour fire resistance rating with opening protectives in accordance with the applicable building code.
  - (b) Where the walls below the horizontal assembly have a minimum 3-hour fire resistance rating with opening protectives as required for walls forming a 3-hour fire barrier, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire resistance rating, provided that all the following conditions are met:
    - i. The building above the horizontal assembly is not required to be of Type I construction.
    - ii. The enclosure connects less than four stories above the horizontal assembly.
    - iii. The enclosure opening protectives above the horizontal assembly have a minimum 1-hour fire protection rating.

(4) The building above the horizontal assembly shall contain only business, mercantile, storage, or residential occupancies or assembly occupancies having an assembly room with an occupant load of less than 300.

(5) The building below the horizontal assembly shall be an enclosed or open parking structure used for the parking and storage of private motor vehicles unless otherwise permitted by the following:

- (a) Entry lobbies, mechanical rooms, and similar uses incidental to the operation of the building shall be permitted.
- (b) Business, mercantile occupancies, and assembly occupancies having an assembly room with an occupant load of less than 300 shall be permitted in addition to those uses incidental to the operation of the building (including storage areas), provided that the entire structure below the horizontal assembly is protected throughout by an approved, electrically supervised automatic sprinkler system installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

(6) The maximum building height shall not exceed the limits set forth in the applicable building code for the least restrictive type of construction involved.

**6.6.2 Two-Hour Fire Resistance-Rated Noncombustible or Limited-Combustible Roof Assemblies.** Fire walls shall be permitted to terminate against the underside of noncombustible or limited-combustible roof sheathing, deck, or slab where the roof assembly and the entire length and span of supporting elements for the roof assembly has a fire resistance rating of not less than 2 hours.

### 6.6.3 Type I or Type II Construction.

**6.6.3.1** In buildings of Type I or Type II construction, fire walls shall be permitted to terminate at the underside of



noncombustible roof sheathing, deck, or slabs where the roof is provided with not less than a Class B roof covering.

**6.6.3.2** Openings in the roof of a building of Type I or Type II construction shall not be located within 48 in. (1220 mm) of the fire wall.

**6.6.4 Types III, IV, or V Construction.** In buildings of Type III, Type IV, and Type V construction, fire walls shall be permitted to terminate at the underside of roof sheathing or deck in accordance with 6.6.4.1, 6.6.4.2, or 6.6.4.3.

**6.6.4.1** Fire walls shall be permitted to terminate at the underside of roof sheathing or deck, provided that all of the following criteria are met:

- (1) The roof assembly within 48 in. (1220 mm) of each side of the fire wall is of fire retardant-treated wood.
- (2) The roof is provided with not less than a Class B roof covering.
- (3) Openings in the roof are not located within 48 in. (1220 mm) of the fire wall.

**6.6.4.2** Fire walls shall be permitted to terminate at the underside of the roof sheathing, where the roof sheathing or deck is constructed of approved noncombustible or limited-combustible materials or of fire retardant-treated wood for a distance of 48 in. (1220 mm) on both sides of the wall.

**6.6.4.3** Fire walls shall be permitted to terminate at the roof sheathing or deck, provided all of the following criteria are met:

- (1) The underside of the roof sheathing or deck is protected with  $\frac{5}{8}$  in. (16 mm) Type X gypsum board applied directly beneath the underside of the roof sheathing or deck.
- (2) The Type X gypsum board is supported by a minimum of 2 in. (51 mm) ledgers attached to the sides of the roof framing members.
- (3) The Type X gypsum board is applied on both sides of the fire wall for a minimum distance of 48 in. (1220 mm) on both sides of the fire wall.
- (4) Openings in the roof are not located within 48 in. (1220 mm) of the fire wall.
- (5) The roof is covered with a minimum Class C roof covering.

**6.7 Fire Walls with Elevation Differences.** Where a fire wall separates parts of a building having different heights, the fire wall shall be permitted to terminate in accordance with one of the following:

- (1) At a point 36 in. (915 mm) above the lower roof level where the exterior wall for a height of 120 in. (3050 mm) above the lower roof is 1-hour fire resistance-rated construction with openings protected by an assembly having a fire protection rating of not less than  $\frac{3}{4}$  hour.
- (2) At the sheathing of the lower roof where the exterior wall is without openings and where the roof is of at least 1-hour fire resistance-rated construction for a width of at least 120 in. (3050 mm), measured from the wall.

#### 6.8 Clearance.

**6.8.1\*** Clearance to allow for expansion of unprotected structural framework shall be provided.

**6.8.2** This space shall be provided between cantilevered walls and structural framework on each side and between double walls.

**6.8.3** In buildings assigned to Seismic Design Category C, Seismic Design Category D, Seismic Design Category E, or Seismic Design Category F, as determined in accordance with ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*, sufficient separation shall be provided between cantilevered fire walls and adjacent framing on each side and between double walls to allow independent movements of the elements without contact.

#### 6.9 Horizontal Continuity.

##### 6.9.1 Horizontal Termination of Fire Walls.

**6.9.1.1** Fire walls shall be continuous in one of the following situations:

- (1) From exterior wall to exterior wall and extending at least 18 in. (455 mm) beyond the exterior surface of exterior walls.
- (2) From an exterior wall extending at least 18 in. (455 mm) beyond the exterior surface of exterior walls to a fire wall with the same fire resistance rating.
- (3) From fire wall to fire wall, with the same fire resistance ratings.

**6.9.1.2** Fire walls shall be permitted to terminate at the interior face of exterior sheathing, siding, or other exterior finishes where the exterior sheathing, siding, or other exterior finishes are noncombustible or limited combustible and extend 48 in. (1220 mm) on both sides of the fire wall.

**6.9.2\* Horizontal Projecting Elements.** Fire walls shall extend to the outer edge of horizontal projecting elements such as balconies, roof overhangs, canopies, marquees, and architectural projections that are within 48 in. (1220 mm) of the fire wall, unless otherwise permitted by 6.9.2.1, 6.9.2.2, or 6.9.2.3.

**6.9.2.1** Fire walls shall not be required to extend to the outer edge of horizontal projecting elements without concealed spaces where both of the following conditions are met:

- (1) The exterior wall behind and below the projecting element has not less than a 1-hour fire resistance rating for a distance not less than the depth of the projecting element on both sides of the fire wall.
- (2) Openings within such exterior walls are protected by assemblies having a fire protection rating of not less than  $\frac{3}{4}$  hour.

**6.9.2.2** Fire walls shall not be required to extend to the outer edge of noncombustible horizontal projecting elements with concealed spaces where all of the following conditions are met:

- (1) A wall having a fire resistance rating of not less than 1-hour extends through the concealed space.
- (2) The projecting element is separated from the building by construction having a fire resistance rating of not less than 1 hour for a distance on each side of the fire wall equal to the depth of the projecting element.
- (3) Openings within such exterior walls are protected by assemblies having a fire protection rating of not less than  $\frac{3}{4}$  hour.

**6.9.2.3** Fire walls shall not be required to extend to the outer edge of combustible horizontal projecting elements with concealed spaces where all of the following conditions are met:

- (1) The fire wall extends through the concealed space to the outer edges of the projecting elements.

- (2) The exterior wall behind and below the projecting element has a fire resistance rating of not less than 1 hour for a distance not less than the depth of the projecting elements on both sides of the fire wall.
- (3) Openings within such exterior walls are protected by assemblies having a fire protection rating of not less than  $\frac{3}{4}$  hour.

**6.10 Opening Protectives.** Openings permitted in fire walls shall comply with Sections 4.8 and 6.10.

**6.10.1 Maximum Openings.** The total width of all openings in fire walls shall not exceed 25 percent of the length of the wall in each story.

**6.10.2 Single Opening Size.**

**6.10.2.1** Single opening protectives in fire walls shall not exceed the maximum size tested.

**6.10.2.2** Single opening protectives in fire walls shall not be limited in size where the buildings on both sides of the fire wall are protected throughout by automatic sprinkler systems in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*, or NFPA 13R, *Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height*.

**6.10.3\* Double Fire Walls.** Openings in double fire walls shall be protected using one fire door in each separate wall.

**6.10.4\* Material Handling Systems.** Where material handling systems penetrate a fire wall, the system design shall provide a method to stop the material handling system and allow fire doors to close without obstruction.

## Chapter 7 Fire Barrier Walls

**7.1 Scope.** Fire barrier walls shall meet the requirements of this chapter and Chapter 4 except as modified by this chapter.

**7.2 Continuity.**

**7.2.1** Fire barrier walls shall be continuous from one of the following or a combination thereof:

- (1) An exterior wall to an exterior wall
- (2) A floor below to a floor or roof above
- (3) One fire barrier wall to another fire barrier wall, fire wall, or HC fire wall having a fire resistance rating of not less than that required for the fire barrier wall

**7.2.2** Fire barrier walls shall be continuous through all concealed spaces, such as those found above a ceiling, including interstitial spaces.

**7.2.3** A fire barrier wall required for an occupied space below an interstitial space shall not be required to extend through the interstitial space, provided that the construction assembly forming the bottom of the interstitial space has a fire resistance rating not less than that of the fire barrier wall.

**7.2.4\*** The fire barrier wall shall be permitted to terminate at an individually protected structural member in the same plane, provided the structural member has a fire resistance rating of not less than that required for the fire barrier wall.

**7.2.5** Structural elements supporting fire barrier walls shall have a fire resistance rating of not less than required for the

wall except as modified by NFPA 220, *Standard on Types of Building Construction*, 5.1.2.2.

**7.3 Opening Protectives.**

**7.3.1** Openings permitted in fire barrier walls shall comply with the requirements of Sections 4.8 and 7.3.

**7.3.2** The total glazing area in fire door assemblies and fire window assemblies shall not exceed 25 percent of the wall common to any room.

## Annex A Explanatory Material

*Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.*

**A.3.3.2.2 Fire Damper.** Fire dampers are classified for use in either static systems that will automatically shut down in the event of a fire, or in dynamic systems that operate in the event of a fire. A dynamic fire damper is tested and rated for closure under airflow.

**A.3.3.6 Fire Resistance Rating.** The fire test exposure should be established in accordance with the test procedures of ASTM E 119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, or of ANSI/UL 263, *Standard for Fire Tests of Building Construction and Materials*.

**A.3.3.9 Grade Plane.** See Section 4.10 for establishment of the grade plane. Vertical measurements can include the number of stories and the building height in feet.

**A.3.3.11.1 Membrane Penetration.** A membrane penetration identifies those openings that are to accommodate cables, cable trays, cabinets, conduits, electrical fixtures and outlets, pipes, wires, vents, and similar items.

**A.3.3.11.2 Through-Penetration.** The term *through-penetration* identifies those openings that are to accommodate cables, cable trays, cabinets, conduits, electrical fixtures and outlets, pipes, wires, vents, and similar items. Blank openings and openings for ducts, chimneys, vents, and similar items can also be through-penetrations.

**A.3.3.14.6 Fire Wall.** Portions of structures that are subdivided by fire walls are permitted to be considered separate buildings for the purpose of applying this standard. The intent of the definition is that fire walls have sufficient structural stability to maintain the integrity of the wall in the event of the collapse of the building construction on either side of the wall.

**A.4.2** Other loads, such as seismic loads or interior pressure differences due to wind, can govern and should be considered in accordance with local code requirements. Parapets should be designed for wind loads, including appropriate pressure coefficients.

**A.4.3.2.2** The intent of this provision is to permit the provisions of either ASCE/SFPE 29 or ACI 216.1/TMS 0216.1 to be used for the calculation of fire resistance of concrete or masonry elements or assemblies.

**A.4.4.2** In engineered smoke management systems, the designer should consider the use of high-temperature links on fire dampers where air-handling ducts penetrate fire barriers.

**A.4.4.5** For smoke control systems, see NFPA 92, *Standard for Smoke Control Systems*.

