



**Date:** December 1, 2023  
**To:** City of Houston HPW-HPC  
**Attention:** CCM  
**From:** Jensen Hughes  
**Subject:** Atrium-Means of Egress and Separation Requirements

---

This technical memo is provided to describe the significant changes to the Houston Construction Codes with regards to the requirements of an Atrium's means of egress and separation requirements.

The revised definition of atrium in **Section 202** is now limited to addressing only two conditions: 1) an atrium is a vertical space enclosed at the top, and 2) an atrium typically connects three or more stories. The primary significance of the modification to the definition is the increase in the threshold from two to three stories before an atrium condition is created in all occupancies except Group I-2 and I-3.

Per **Section 404.6**, horizontal assembly separation of the atrium from adjacent spaces is no longer required at those openings created for compliant escalators and/or exit access stairways, per Exceptions 5 and 6 of the 2021 Building Code. The basic requirement is that the atrium space be separated from adjacent areas by fire barriers and horizontal assemblies having a fire-resistance rating of at least 1 hour. Two new exceptions to the enclosure requirements address conditions where escalators and/or exit access stairways penetrate the required horizontal assembly. These exceptions recognize that no horizontal assembly separation of the atrium is required at those locations where openings are created for such escalators and/or stairways.

The application of the atrium provisions has been clarified, and several means of egress provisions applicable to atriums have been relocated to Chapter 10 (**Section 1017.3.2**). It is the intent that the revision to the scoping language of **Section 404.1** will provide the needed clarity for when the atrium provisions are applied. Regarding a related issue, a change in format has resulted in the special travel distance limitation provision previously located in **Section 404.9** being relocated to Chapter 10 in new **Section 1017.3.2**. Although the three potential exiting scenarios that are possible in an atrium situation may appear specific to atriums, they are not entirely self-contained. The limitations to travel must be evaluated as part of the general travel distance provisions of **Section 1017**, and thus have been relocated to that area of the code. The acceptable use of interior exit stairways within an atrium for egress purposes has also been reformatted for reasons similar to that for the relocation of the atrium travel distance provisions and are now located in **Section 1028**, as shown in **Section 404.11** of the 2021 Building Code.

The intent of Exception 3 in **Section 1006.3.2** is to recognize that, although an exit access stairway can generally serve as a portion of the required egress path for travel through only one adjacent story, it is permissible that the egress stairway be unenclosed and connect to multiple stories within an atrium.

**memo.**

2021 Houston Building Code Changes –**SECTION 202  
GENERAL DEFINITIONS.**

**ATRIUM.** ~~An opening~~ **A vertical space that is closed at the top,** connecting two or more stories ~~other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air conditioning or other equipment, which is closed at the top and not defined as a mall. Stories, as used in this definition, do not include balconies within assembly groups or mezzanines that comply with Section 505.~~ **in Group I-2 and I-3 occupancies or three or more stories in all other occupancies.**

**SECTION 404  
ATRIUMS.**

**404.6 Enclosure of atriums.** Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 711, or both.

**Exceptions:**

1. A fire barrier is not required where a glass wall forming a smoke partition is provided. The glass wall shall comply with all of the following:
  - 1.1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the atrium side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction;
  - 1.2. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates; and
  - 1.3. Where glass doors are provided in the glass wall, they shall be either self-closing or automatic closing.
2. A fire barrier is not required where a glass-block wall assembly complying with Section 2110 and having a 3/4-hour fire protection rating is provided.
3. A fire barrier is not required between the atrium and the adjoining spaces of **any** up to three floors of the atrium provided that such spaces are accounted for in the design of the smoke control system.
4. A fire barrier is not required between the atrium and the adjoining spaces where the atrium is not required to be provided with a smoke control system.
5. **A horizontal assembly is not required between the atrium and openings for escalators complying with Section 712.1.3.**
6. **A horizontal assembly is not required between the atrium and openings for exit access stairways and ramps complying with Item 4 of Section 1019.3.**

**404.9 Exit access travel distance.** Exit access travel distance for areas open to an atrium shall comply with the requirements of ~~this section.~~ **Section 1017.**

~~404.9.1 Egress not through the atrium. Where required access to the exits is not through the atrium, exit access travel distance shall comply with Section 1017.~~

~~404.9.2 Exit access travel distance at the level of exit discharge. Where the path of egress travel is through an atrium space, exit access travel distance at the level of exit discharge shall be determined in accordance with Section 1017.~~



~~404.9.3 Exit access travel distance at other than the level of exit discharge. Where the path of egress travel is not at the level of exit discharge from the atrium, that portion of the total permitted exit access travel distance that occurs within the atrium shall be not greater than 200 feet (60 960 mm).~~

**404.10 Exit stairways in an atrium.** Where an atrium contains an interior exit stairway all the following shall be met:

1. The entry to the exit stairway is the edge of the closest riser of the exit stairway.
2. The entry of the exit stairway shall have access from a minimum of two directions
3. The distance between the entry to an exit stairway in an atrium and the entrance to a minimum of one exit stairway enclosed in accordance with Section 1023.2 shall comply with the separation required by Section 1007.1.1.
4. Exit access travel distance shall be measured to the closest riser of the exit stairway.
5. Not more than 50 percent of the exit stairways shall be located in the same atrium.

~~404.10~~ **404.11 Interior exit stairways-stairway discharge.** A maximum of 50 percent Discharge of interior exit stairways are permitted to egress through an atrium on the level of exit discharge shall be in accordance with Section 1028.

## **SECTION 707 FIRE BARRIERS.**

**707.3.6 Atriums.** The fire-resistance rating of the fire barrier separating atriums shall comply with Section 404.6.

**707.6 Openings.** Openings in a fire barrier shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m<sup>2</sup>). Openings in enclosures for exit access stairways and ramps, interior exit stairways and ramps and exit passageways shall also comply with Sections 1019, 1023.4 and 1024.5, respectively.

### **Exceptions:**

1. Openings shall not be limited to 156 square feet (15 m<sup>2</sup>) where adjoining floor areas are equipped
1. throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m<sup>2</sup>) or an aggregate width of 25 percent of the
3. length of the wall where the opening protective is a fire door serving enclosures for exit access stairways and ramps, and interior exit stairways and ramps.
4. Openings shall not be limited to 156 square feet (15 m<sup>2</sup>) or an aggregate width of 25 percent of the
5. length of the wall where the opening protective has been tested in accordance with ASTM E119 or UL 263 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
6. 4. Fire window assemblies permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of the length of the wall.
6. Openings shall not be limited to 156 square feet (15 m<sup>2</sup>) or an aggregate width of 25 percent of the
7. length of the wall where the opening protective is a fire door assembly in a fire barrier separating an enclosure for exit access stairways and ramps, and interior exit stairways and ramps from an exit pas-sage way in accordance with Section 1023.3.1.



**TABLE 716.1(3)  
FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS**

TYPE OF WALL ASSEMBLY	REQUIRED WALL ASSEMBLY RATINGS (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)	FIRE-RATED GLAZING MARKING
Interior walls			
Atrium separations (Section 707.3.6), Incidental use areas (Section 707.3.7), <sup>c</sup> Mixed occupancy separations (Section 707.3.9)	1	¾	OH-45 or W-60

c. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 of the International Fire Code to enclose energy storage systems. Fire-resistance-rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 716.1.2.3, shall be permitted.

**SECTION 1006  
NUMBER OF EXITS AND EXIT ACCESS DOOWAYS.**

Section 1006 analysis has been performed between 2018 and 2021 IBC base codes.

~~1006.3.1~~ **1006.3.2 Adjacent story Path of egress travel.** The path of egress travel to an exit shall not pass through more than one adjacent story.

**Exception:** The path of egress travel to an exit shall be permitted to pass through more than one adjacent story in any of the following:

1. In Group R-1, R-2 or R-3 occupancies, exit access stairways and ramps connecting four stories or less serving and contained within an individual dwelling unit, sleeping unit or live/work unit.
2. Exit access stairways serving and contained within a Group R-3 congregate residence or a Group R-4 facility.
- 3. Exit access stairways and ramps within an atrium complying with Section 404.**
- ~~3.~~ **4.** Exit access stairways and ramps in open parking garages that serve only the parking garage.
- ~~4.~~ **5.** Exit access stairways and ramps serving open-air assembly seating complying with the exit access travel distance requirements of Section 1030.7.
- ~~5.~~ **6.** Exit access stairways and ramps between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums and sports facilities.
- 7. Exterior exit access stairways and ramps between occupied roofs.**

**SECTION 1017  
EXITS ACCESS TRAVEL DISTANCE.**



**1017.3.2 Atriums.** Exit access travel distance for areas open to an atrium shall comply with the requirements of Sections 1017.3.2.1 through 1017.3.2.3.

**1017.3.2.1 Egress not through the atrium.** Where required access to the exits is not through the atrium, exit access travel distance shall comply with Section 1017.2.

**1017.3.2.2 Exit access travel distance at the level of exit discharge.** Where the path of egress travel is through an atrium space, exit access travel distance at the level of exit discharge shall be determined in accordance with Section 1017.2.

**1017.3.2.3 Exit access travel distance at other than the level of exit discharge.** Where the path of egress travel is not at the level of exit discharge from the atrium, that portion of the total permitted exit access travel distance that occurs within the atrium shall be not greater than 200 feet (60 960 mm).

## **SECTION 1028 EXIT DISCHARGE.**

**1028.1 1028.2 General Exit discharge.** Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide a direct path of egress travel to grade. The exit discharge shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and minimum width or required capacity of the required exits.

### **Exceptions:**

1. Not more than 50 percent of the number and minimum width or required capacity of interior exit stairways and ramps is permitted to egress through areas, **including atriums**, on the level of discharge provided that all of the following conditions are met:
  - 1.1. Discharge of interior exit stairways and ramps shall be provided with a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the enclosure.
  - 1.2. The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.
  - 1.3. The egress path from the interior exit stairway and ramp on the level of exit discharge is protected throughout by an approved automatic sprinkler system. Portions of the level of exit discharge with access to the egress path shall be either equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 or separated from the egress path in accordance with the requirements for the enclosure of interior exit stairways or ramps.
  - 1.4. Where a required interior exit stairway or ramp and an exit access stairway or ramp serve the same floor level and terminate at the same level of exit discharge, the termination of the exit access stairway or ramp and the exit discharge door of the interior exit stairway or ramp shall be separated by a distance of not less than 30 feet (9144 mm) or not less than one-fourth the length of the maximum overall diagonal dimension of the building, whichever is less. The distance shall be measured in a straight line between the exit discharge door from the interior exit stairway or ramp and the last tread of the exit access stairway or termination of slope of the exit access ramp.

