



**Date:** December 1, 2023  
**To:** City of Houston HPW-HPC  
**Attention:** CCM  
**From:** Jensen Hughes  
**Subject:** IBC Sprinkler Requirements for Parking Garages

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This technical memo is provided to describe significant changes to the Houston Construction Codes with regards to the sprinkler requirements for parking garages.

In summary, this change to the IBC code is requiring an automatic sprinkler system to now be installed in an open parking garage where a specific fire area or height threshold is exceeded. This was previously not the standard, and as detailed below, additions and subtractions were made to the code to address this new standard.

Open parking garages, in the past have not been required to have sprinkler systems. This was due to both a relatively good fire record and previous fire test data. In recent years however, with the change in the materials used in the manufacture of automobiles, more flammable materials like plastics and lightweight materials are being used as opposed to the metals of the past. Additionally, new types of fuels are being used in automobiles that provide more power and are more flammable. Based on these greater hazards due to the increase in individual vehicle's fire fuel loading and it was determined that sprinkler protection should be provided at an established threshold. A case study on a fire that occurred in a parking garage in Liverpool, England on December 31st, 2017, provided further evidence that sprinkler systems will be necessary for a proper safety standard in modern parking garages.

Fire areas are defined as the aggregate floor area enclosed by fire walls, fire barriers, exterior walls, or fire-resistance-rated horizontal assemblies of a building. Typically, the fire area would be the floor's area.

In **Section 903.2.10** a 48,000 square-foot fire area threshold was selected because it was four times the general 12,000 square foot limit and thus would make the impact of the new sprinkler requirement less strenuous on new construction plans. This revision would only impact larger garages. An additional justification for the area limit selected was that it has an approximate equivalency to a 200-foot by 200-foot area and the length limit of preconnected fire hoses connected to standpipes. It should be noted that if a parking garage fire area exceeds 48,000 square feet, the entire building must be protected with an automatic sprinkler system.

**Section 903.2.10.2** includes newly added section pertaining to Mechanical-Access Enclosed Parking Garges.

Within the high-rise provisions of **Section 403.3**, there has previously been an exception for the parking garages that service high-rise buildings. This exception has been removed, resulting in the new requirement of sprinkler protection of a high-rise building including its open parking garage in regardless of the size of the garage fire area.

A similar step was taken in **Section 903.2.11.3** with regards to buildings having one or more stories with an occupant load of 30 or more located 55 feet or more above the lowest level of fire department vehicle access. In those buildings containing an open parking garage where the occupant load and height thresholds are exceeded, the entire building, including the parking garage, is now required to be sprinklered. The sprinkler protection of the open garage is now mandatory regardless

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of the garage's fire area size. It should be noted that the provisions apply to both single-occupancy open parking garages as well as to mixed-occupancy conditions where a Group S-2 open parking garage is not the only occupancy in the building.

## **2021 Houston Building Code Changes –**

**903.2.10 Group S-2 Enclosed Parking Garages.** An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.6 where either **any** of the following conditions exists:

1. Where the fire area of the enclosed parking garage in accordance with **Section 406.6** exceeds 12,000 square feet (1115 m<sup>2</sup>).
2. Where the enclosed parking garage in accordance with **Section 406.6** is located beneath other groups.  
**Exception:** Enclosed parking garages located beneath Group R-3 occupancies.
3. **Where the fire area of the open parking garage in accordance with Section 406.5 exceeds 48,000 square feet (4460 m<sup>2</sup>).**

**903.2.10.1 Commercial Parking Garages.** An automatic sprinkler system shall be provided throughout buildings used for storage of commercial motor vehicles where the fire area exceeds 5,000 square feet (464 m<sup>2</sup>).

**903.2.10.2 Mechanical-Access Enclosed Parking Garages.** An approved automatic sprinkler system shall be provided throughout buildings used for the storage of motor vehicles in a mechanical-access enclosed parking garage. The portion of the building that contains the mechanical-access enclosed parking garage shall be protected with a specially engineered automatic sprinkler system.

**403.3 Automatic Sprinkler System.** Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with **Section 903.3.1.1** and a secondary water supply where required by **Section 403.3.3**.

**Exception:** An automatic sprinkler system shall not be required in spaces or areas off-~~telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour fire barriers constructed in accordance with Section 707 or not less than 2-hour horizontal assemblies constructed in accordance with Section 711, or both.~~

- ~~1. Open parking garages in accordance with Section 406.5.~~
- ~~2. Telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour fire barriers constructed in accordance with Section 707 or not less than 2-hour horizontal assemblies constructed in accordance with Section 711, or both.~~

**903.2.11.3 Buildings 55 Feet or More in Height.** An automatic sprinkler system shall be installed throughout buildings that have one or more stories with an occupant load of 30 or more located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access, measured to the finished floor.

### **Exceptions:**

- ~~1. Open parking structures.~~
2. Occupancies in Group F-2.

