



City Council
Workshop
August 4, 2025

Hangar Fire Protection Solutions and the International Fire Code





Hangar Fire Protection Solutions

- Council Workshops
 - January 14, 2025
 - June 10, 2025
- At the June 10th Workshop several fire protection options were discussed for the new hangar project.
- After further review, staff began drafting an ordinance amendment that would eliminate the requirement for a fire suppression system in Group III hangars under 12,000 square feet if they were equipped with a monitored fire alarm.



Hangar Types and Fire Suppression Requirements

- **Group I-** Large hangars designed for major aircraft maintenance or overhaul.



A combination of automatic sprinkler protection and an ignitable liquid drainage floor assembly is required.

- **Group II-** Medium-size hangars used for routine service, storage, or minor repairs.



A combination of automatic sprinkler protection and an ignitable liquid drainage floor assembly is required.

- **Group III-** Smaller, lower-risk hangars, primarily for storage or light maintenance.



No fire protection system is required unless it houses hazard operations.



Hangar Types and Fire Suppression Cost (based on 12,000 sq. ft)

- **Group I or II Foam-** A combination of automatic sprinkler protection and an ignitable liquid drainage floor assembly is required
 - Cost- \$300,000 - \$600,000
- **Group I or II Wet-** A combination of automatic sprinkler protection and an ignitable liquid drainage floor assembly is required
 - Cost- \$170,000 - \$360,000
- **Group III Wet-** An automatic sprinkler system
 - Cost- \$45,000 - \$75,000
- **Group III Alarm-** An automatic fire alarm system
 - Cost- \$25,000 - \$50,000

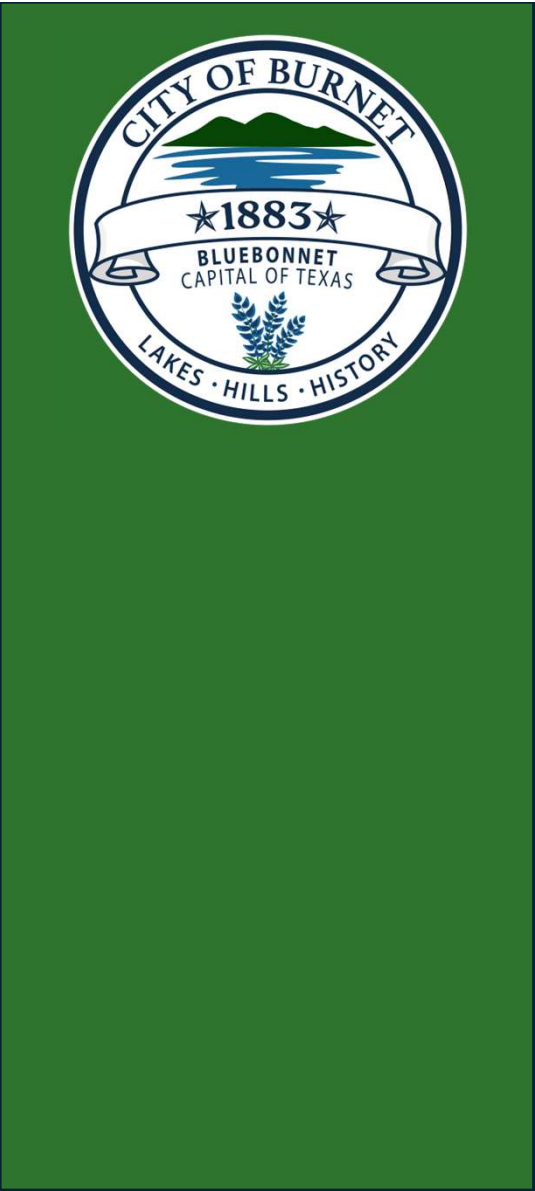


TABLE 914.8.3

[illegible]



New Hangar

- Group II Hangar
- Square Footage of Hangar: 11,992 sq ft
- Door Height: 28 ft
- Aircraft Design Capacity:
 - Falcon 900: 3,120 gallons
 - Falcon 900: 3,120 gallons
 - Citation CJ1: 480 gallons
 - Average Larger Helicopter: 100- 1,000 gallons

Total Gallons: 7,720 gallons



Under existing code, because of the 7,720 gallons of fuel, a Group I or II fire suppression system is required for the new hangar.



Current Code

IFC 2021

914.8.3.1 Hazardous operations.

Any Group III aircraft hangar in accordance with [Table 914.8.3](#) that contains hazardous operations including, but not limited to, the following shall be provided with a **Group I or II fire suppression system** in accordance with [NFPA 409](#) as applicable:

1. Doping.
2. *Hot work* including, but not limited to, welding, torch cutting and torch soldering.
3. Fuel transfer.
4. Fuel tank repair or maintenance not including defueled tanks in accordance with [NFPA 409](#), inerted tanks or tanks that have never been fueled.
5. Spray finishing operations.
6. **Total fuel capacity of all aircraft within the unsprinklered single fire area in excess of 1,600 gallons (6057 L).**
7. **Total fuel capacity of all aircraft within the maximum single fire area in excess of 7,500 gallons (28 390 L) for a hangar equipped throughout with an automatic sprinkler system installed in accordance with [Section 903.3.1.1](#).**



Current Code Simplified

- A Group I or II fire suppression system IS REQUIRED in the hangar if any of the following hazardous operations are planned:
 - Doping.
 - Hot work (including welding, torch cutting, torch soldering)
 - Fuel transfer.
 - Fuel tank repair or maintenance (excluding defueled, inerted, or never-fueled tanks, per NFPA 409).
 - Spray finishing operations.
- In addition, a Group I or II fire suppression system is required in a Group III hangar if:
 - The total aircraft fuel in the hangar exceeds 1,600 gallons and *there is no sprinkler system*, and/or
 - The hangar has a sprinkler system and the total aircraft fuel exceeds 7,500 gallons



Original Draft Amendment

IFC 2021

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5. Spray finishing operations.
6. Total fuel capacity of all aircraft within the unsprinklered single *fire area* in excess of 1,600 gallons (6057 L).
7. Total fuel capacity of all aircraft within the maximum single *fire area* in excess of 7,500 gallons (28 390 L) for a hangar equipped throughout with an *automatic sprinkler system* installed in accordance with [Section 903.3.1.1](#).

***Subsections (6) and (7) above shall not apply to Group III aircraft hangars 12,000 square feet or less than that are equipped with a monitored fire alarm system.**



Standard Wet-Pipe Sprinkler System- **New Perspective**

- The ambulance fire caused a shift in thinking. A standard wet-pipe sprinkler system installed in Station 2 prevented this fire from becoming a fuel fire and destroying the building.
- Key takeaway: Most fires don't begin as fuel fire- but without proper suppression, they can quickly become one.





Revised Proposal (In Red)

IFC 2021

914.8.3.1 Hazardous operations.

6. Total fuel capacity of all aircraft within the unsprinklered single *fire area* in excess of 1,600 gallons (6057 L).
7. Total fuel capacity of all aircraft within the maximum single *fire area* in excess of 7,500 gallons (28 390 L) for a hangar equipped throughout with an *automatic sprinkler system* installed in accordance with [Section 903.3.1.1](#).

Exceptions:

- Subsection 6 shall not apply to Group III aircraft hangars with a single fire area of 6,500 square feet or less that are used for storage or servicing of aircraft if equipped with a monitored fire alarm system.
- Subsections 6 and 7 shall not apply to Group III aircraft hangars with a single fire area greater than 6,500 square feet, but less than 12,000 square feet used for storage or service of aircraft if equipped with a monitored fire alarm system and a wet, dry, dual action, or deluge automatic sprinkler system.



What do the Exceptions Mean?

Current Code			
Fuel Capacity	Square Footage		
	Under 6,500	6,500 to 12,000	Over 12,000
Under 1,600 gallons	N/A	N/A	N/A
1,600 to 7,500 gallons	<u>M,S</u> GI/GII	<u>M,S</u> GI/GII	<u>M,S</u> GI/GII
Over 7,500 gallons	GI/GII	GI/GII	GI/GII

Monitored Fire Alarm - M
Sprinklers - S
Group I or Group II - GI/GII

Staff Proposed Amendment			
Fuel Capacity	Square Footage		
	Under 6,500	6,500 to 12,000	Over 12,000
Under 1,600 gallons	N/A	N/A	N/A
1,600 to 7,500 gallons	M	M,S	<u>M,S</u> GI/GII
Over 7,500 gallons	M,S	M,S	GI/GII

Monitored Fire Alarm - M
Sprinklers - S
Group I or Group II - GI/GII



Impact of the Staff Recommended Amendments to the Fire Code

Scenario

Cessna Citation Latitude (1,700 gallons)

80' x 80' hangar

Current Code – up to \$325,000.

Proposed Amendment - \$19,500 to \$39,000.

Proposed Amendment offers a reasonable level of fire protection at a significantly lower cost for smaller hangars.



New Hangar Impact

- Group II Hangar
- Square Footage of Hangar: 11,992 sq ft
- Door Height: 28 ft
- Aircraft Design Capacity:
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Under the proposed exceptions, the new hangar would require a monitored fire alarm system and a wet, dry, dual action, or deluge automatic sprinkler system, rather than a Group I or II fire suppression system.



Impact on New Hangar Project

- With amendment, automatic sprinkler system with monitored fire alarm system

Cost- \$64,307 + underground line extension/electrical

- Without the approved amendment, the Group I or II required systems could cost up to \$400,000



**RAMP Grant
Eligible Expense**





Fire Code Options





Keep Everything as Written

IFC 2021

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IFC 2021

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Hot work including, but not limited to, welding, torch cutting and torch soldering.

Fuel transfer.

Fuel tank repair or maintenance not including defueled tanks in accordance with [NFPA 409](#), inerted tanks or tanks that have never been fueled.

Spray finishing operations.

Total fuel capacity of all aircraft within the unsprinklered single *fire area* in excess of 1,600 gallons (6057 L).*

Total fuel capacity of all aircraft within the maximum single *fire area* in excess of 7,500 gallons (28 390 L) for a hangar equipped throughout with an *automatic sprinkler system* installed in accordance with [Section 903.3.1.1](#).*

*Subsections (6) and (7) above shall not apply to Group III aircraft hangars 12,000 square feet or less than that are equipped with a monitored fire alarm system.



Current Proposed Amendment (In Red)

IFC 2021

914.8.3.1 Hazardous operations.

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Next Steps

- Staff is seeking Council direction
- Proposed amendments scheduled to be placed on the August 12th agenda





Questions?

