

Welcome to the

2018 Annual Conference Educational Sessions

**Session: 2018 IFC Essentials –
General Precautions Against Fire**

Sponsored by

ORACLE®

2018 IFC® Essentials: General Precautions Against Fire

**Based on the 2018 International Fire Code®
(IFC®)**

Welcome

- Instructor introduction
- Exits
- Breaks and Schedule
- Cell Phones
- Student Introductions



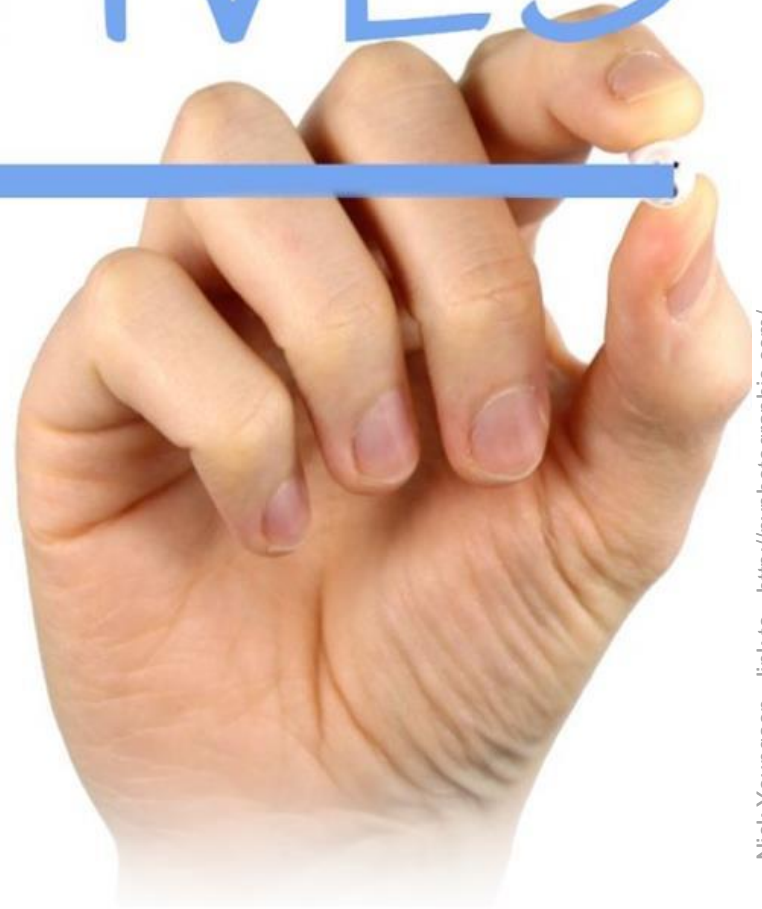


Identify the general
precautions against fire
in the 2018 IFC



OBJECTIVES

1. Explain the fundamental provisions of the 2018 IFC.
2. Describe the intent and scope of the 2018 IFC.
3. Identify common fire hazards and understand how the 2018 IFC addresses correction, mitigation or elimination of the hazards.
4. Describe general precautions against fire.



Nick Youngson - link to - <http://nyphotographic.com/>



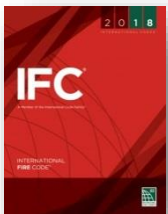


Guide to a successful class:

- Slides contain some text and images to help you learn
- Follow along in the course handout
- Ask Questions, ask questions, ASK QUESTIONS!!!!

Introduction Activity

- Introduce yourself to two people you do not know.



Overview of the IFC



The International Fire Code

- Major themes of the IFC
 - Protection of the occupants
 - Protection of the public
 - Protection of the emergency responders
- The IFC addresses various hazards
 - Building use and operation
 - Storage and use of combustible materials
 - Storage and handling of hazardous materials
 - Fire department access
 - Water supplies



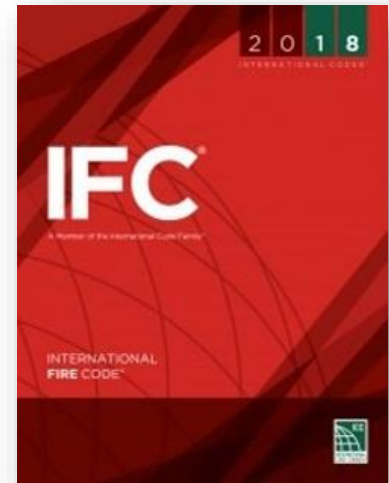
Development Cycle

- New code published every 3 years
- 12 month code change cycles
- Codes divided into 2 groups
 - IBC, IFC, IFGC, IMC, IPC, IPMC, IPSDC, IRC, ISPSC, IWUIC
 - Admin, IBC-S, IEBC, IECC, IgCC, IRC-B



IFC – International Fire Code

- Provides a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings and facilities
- Addresses design, construction, installation, testing and maintenance of fire protection systems
- Contains regulations for the safety of firefighters and emergency responders during emergency operations



Navigating the IFC

- 7 major parts to the IFC

Part	Title		Chapters
I	Administrative		1 – 2
Subject		IBC Chapter	3 – 4
Fire & Smoke Protection Features		7	5 – 12
Interior Finish, Decorative Materials & Furnishings		8	20 – 39
Fire Protection & Life Safety Systems		9	50 – 67
Means of Egress		10	80
Fire Safety During Construction & Demolition		33	Appendices A – N



Applicability

§102.1

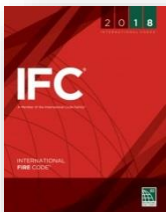
- IFC construction requirements apply to:
 - Structures, facilities and conditions that arise after the code is adopted
 - Existing structures, facilities and conditions not legally in existence at the time the code is adopted
 - Existing structures, facilities and conditions when required by Ch 11
 - Existing structures, facilities and conditions which, in the life hazard to
 - IF the appendices are adopted:***
 - Appendix K (ambulatory care facilities)**
 - Appendix M (sprinklers in high-rise)**



Applicability

§102.2

- IFC administrative, operational and maintenance requirements apply to:
 - New conditions and operations arising after the adoption of this code
 - Existing conditions and operations



Retroactive Application of Construction Requirements

- §102.1 Item 3 refers to Ch 11
 - Ch 11 contains retroactive construction requirements for existing buildings
 - Ch 11 establishes minimum safety requirements for existing buildings
 - Protection
 - Installation
 - Representation
 - Provision
- Ch 11 requirements are less restrictive than new construction requirements
 - Ch 11 is designed to mitigate specific life hazards in existing buildings

which



Change of Use or Occupancy

§102.3

- The C of O can be used to verify the building's occupancy or use has not changed
- IFC generally prohibits a change of occupancy or use unless the change is done in conformance with the IBC
- Some changes are allowed when:
 - It does not change the overall use or character of a building
 - It reduces the hazard

Certificate of Occupancy
Granted by
KERN COUNTY DEPARTMENT OF ENGINEERING, SURVEYING & PERMIT SERVICES
BUILDING INSPECTION DIVISION
2700 M Street, Suite 570, Bakersfield, CA 93301-2370
Telephone: (805) 862-8600


PROJECT ADDRESS: 6764 MOUNTAIN VIEW AV. INYOKERN DATE: 04/16/2014
LEGAL DESCRIPTION: 064-060-037 PERMIT NO: K201304800 ZONING: C-2

This is to certify that the building, or portion of building, constructed under the above permit, at the above address, complies with the provisions of the 2013 California Building Standards Code and related ordinances and laws in effect for the following use and occupancy group.

USE: NEW DOLLAR GENERAL STORE

OCCUPANCY GROUP-DIVISION: M TYPE OF CONSTRUCTION: V B
OWNER: RILEY DEVELOPMENT LLC DESIGN OCCUPANT LOAD: 254
10757 N 74TH ST U 1009
SCOTTSDALE, AZ 852606470 FIRE SPRINKLERS: NO


Robert Sawyer, Principal Building Inspector




Greg Fenton, P.E., Director

THIS CERTIFICATE MUST BE POSTED IN A CONSPICUOUS PLACE IN THE BUILDING AND MAY NOT BE REMOVED EXCEPT BY THE BUILDING OFFICIAL.
Plans for this building have been approved and inspection made to verify conformance with current building regulations.
You are responsible for maintaining this building as certified.
NOTE: Make no changes, additions or alterations of any structural, mechanical, plumbing, or electrical without consulting the Building Inspection Division as this will void the Certificate of Occupancy. Make no change of use or occupancy without contacting the Building Inspection Division.

Historic Buildings

§102.6

- Historic buildings generally must be maintained in their original condition
- Historic buildings may lack fire safety features normally required for new buildings having the same occupancy classification
- Unless the building is a distinct hazard, the IFC requires that historic structures be provided with fire protection and life safety features based on an approved fire protection plan



Codes and Standards

§102.7

- “Codes” are documents that are adopted by the authority having jurisdiction

- Requirements in the code supersede the requirements in the referenced standard
- It does not matter which is more ‘restrictive’
- It is based on the hierarchy of the codes



- “Standards” are documents referenced in the codes

- Tell people how to achieve what must be done
- Referenced standards are in Ch 80



Appendices

§101.2.1

- Developed the same as main body of the code
- Some are designed to be adopted

▪ So

- Appendix A Board of Appeals
- Appendix E Hazardous Materials
- Appendix F Hazard Ranking
- Appendix G Cryogenic Conversions
- Appendix I Non-compliant Fire Protection Systems
- Appendix J Building Information Signs
- Appendix K Ambulatory Care Facilities
- Appendix L Fire Fighter Air Replenishment Systems
- Appendix M Sprinklers in Existing High-rise
- Appendix N Indoor Trade Shows and Exhibitions

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Authority

§104

- Local jurisdiction creates the Department of Fire Prevention
- A Fire Code Official (FCO) is appointed to manage the fire prevention office
- Reviews plans, issues permits, inspects work to comply with code and plans
- Interprets code requirements
- Develops policies and procedures to clarify local application of the code



Technical Assistance

§104.7.2

- The code allows the FCO to obtain technical assistance when a plan or project involves a design or system that is complicated or technically challenging

- F
Such as:
 - Hazardous material use and processes
 - Sprinkler design for an extra-high rack storage
 - Specialized automatic fire protection systems

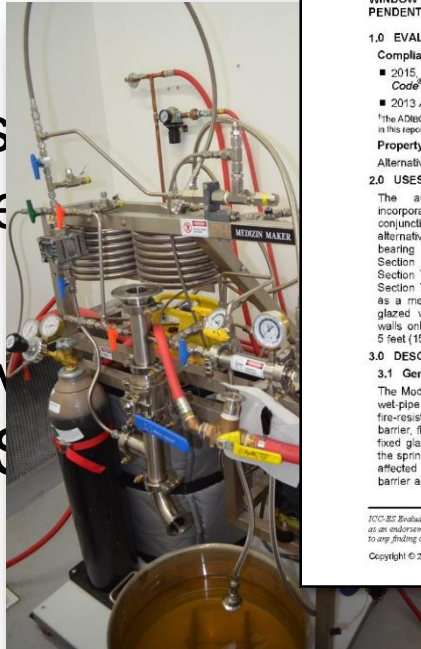
- C
responsibility of the permit applicant


Final approval rests with the FCO

Alternate Materials and Methods

§104.9

- The designer can submit a report for alternate materials and methods requirements using Alternate Materials and Methods (AMM) §104.9
- The FCO reviews alternate designs to determine if they comply with the code
- The alternative must provide equivalent strength, effectiveness and safety
- ICC Evaluation Service provides reports (ES) as part of the evaluation process





ICC EVALUATION SERVICE

Most Widely Accepted and Trusted

ICC-ES Evaluation Report

ESR-2397

Reissued February 2016
This report is subject to renewal February 2018.

www.icc-es.org | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

DIVISION: 21 00 00 FIRE SUPPRESSION
Section: 21 13 13—Wet-Pipe Sprinkler Systems

REPORT HOLDER:

TYCO FIRE PRODUCTS RESEARCH AND DEVELOPMENT
1487 ELMWOOD AVENUE
CRANSTON, RHODE ISLAND 02910
(401) 781-8220
www.tyco-fire.com

EVALUATION SUBJECT:

MODEL WS™—5.6 K-FACTOR SPECIFIC APPLICATION WINDOW SPRINKLERS, HORIZONTAL SIDEWALL AND PENDENT VERTICAL SIDEWALL

1.0 EVALUATION SCOPE
Compliance with the following code:

- 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)¹

¹The ADIBC is based on the 2006 IBC, 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Property evaluated:
Alternative to a fire-resistance-rated wall assembly

2.0 USES
The automatic special-purpose sprinkler system incorporating the Model WS™ sprinkler is used in conjunction with a fixed glazed wall assembly to provide an alternative to a two-hour fire-resistance-rated nonload-bearing interior fire barrier assembly prescribed in IBC Section 707, fire partition assembly prescribed in IBC Section 708 or exterior wall assembly prescribed in IBC Section 705. The Model WS™ sprinklers are recognized as a means to achieve a fire-resistance rating on fixed glazed wall assemblies in exterior fire-resistance-rated walls only when the horizontal fire separation distance is 5 feet (1525 mm) or greater.

3.0 DETAILS
3.1 General:
The Model WS™ window sprinklers are used as part of a wet-pipe fire suppression system to provide a two-hour fire-resistance rating to an interior nonload-bearing fire barrier, fire partition or exterior wall assembly consisting of fixed glazing as described in this report. When activated, the sprinklers are designed to wet the entire surface of the affected side of the fixed glazed openings in the fire barrier and exterior wall assembly in order to achieve the

fire-resistance rating of the wall. For exterior glazed assemblies that are permitted to be rated only from the interior, the sprinklers must be located on the interior side of the glazing. For interior glazed assemblies, the sprinklers must be located on both sides of the assembly. The primary components of the fire-resistance-rated assembly are as described in Sections 3.2 and 3.3.

3.2 Model WS™ Window Sprinklers:
The Model WS™ window sprinklers described in this report are quick-response sprinklers that are available in models that activate to release water flow when they reach an ambient temperature of either 155°F or 200°F (68°C or 93°C). The sprinklers have an orifice and thread size of 1/2 inch (12.7 mm). The sprinklers are manufactured for two orientations. The horizontal sidewall type (product number TY3388), as shown in Figure 1, is designed to face the glazing of the fire barrier assembly in a horizontal orientation. The pendent vertical sidewall type (product number TY3488), as shown in Figure 2, is designed to face the glazing of the fire barrier assembly in a vertical orientation.


3.3 Glazed Fire Barrier Assembly:
The glazing used in the fire barrier must be nominally 1/2-inch-thick heat-strengthened or tempered glass complying with ASTM C1048 or Federal Specification DD-G-1403B, installed as a single pane or dual pane. The exposed glass component of the wall assembly must not exceed 13 feet (4 m) in height. There is no exposed width restriction for the horizontal span, except where necessary to comply with the requirements of IBC Sections 2403 and 2404.

All interfaces between the fixed glazed wall assembly and adjacent wall assemblies must include termination of the glazing within a window frame as described in this section. The glazing is held in place by a metallic frame with an elastomeric seal allowing for thermally initiated contraction and expansion. Unframed vertical joints between glazing panels are permitted provided that such joints are sealed with silicone sealant. Intermediate horizontal mullions are not permitted as part of the fixed glazed wall assembly. The interface details and mounting method must be approved by the code official.

4.0 INSTALLATION
4.1 Sprinkler Orientation:
For the Model WS™ horizontal sidewall sprinkler, the deflector of the sprinkler must be placed from 1/2 inch to 4 inches (12.7 to 102 mm) away from the glass and 1 to 3 inches (25 to 76.2 mm) down from the top of the noncombustible frame as shown in Figure 3.

ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.

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Page 1 of 3



Permits

§105

- A permit is required to:
 - Perform certain hazardous operations
 - Construct or alter fire protection systems
 - Install equipment for storage, handling or use of hazardous materials
- 2 types of permits:
 - Operational
 - 50 operational permits
 - Construction
 - 25 construction permits

- Place of assembly
- Storage or use of haz mat
- High-piled combustible storage
- Storage tank for haz mat
- Security gates on access roads

Permits

§105

- It is very common for a particular facility or regulated use to require both a construction permit and an operational permit



- Installation of explosives magazine
- Storage, use and handling of explosives

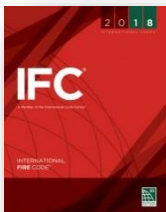


- Installation of aboveground storage tanks
- Dispensing of flammable and combustible liquids

Construction Documents

§105.4

- Drawings
- Specifications
- Prepared by a registered design professional where required by the statutes of the state or jurisdiction
 - FCO can waive this requirement
 - when the work does not require
 - a registered design professional
- Manufacturer's installation instructions



Permit Application

§105.2.4

- The FCO reviews the plans for compliance with the code and the
- FCO can perform inspections of buildings, processes or systems
- This inspection may establish any operational constraints or limits

If the plans are found in compliance, a permit can be issued for the work

If the plans have discrepancies, a plan review report (compliance list) is provided to the applicant

**Application for Permit
Request for Service**

Kern County Fire Department
Office of the Fire Marshal – Fire Prevention
2820 M St. ~ Bakersfield, CA 93301
Telephone (661) 391-3310 ~ Fax (661) 636-0466 or (661) 636-0467
Website: kerncountyfire.org Email: fireprevention@kerncountyfire.org

Date: _____ *To be completed by permit Applicant (PLEASE TYPE)*

Project Name: _____

Project Street Address: _____

City: _____

<input type="checkbox"/> Fire Alarm # of Devices _____	<input type="checkbox"/> Hood Suppression Fire Protection Systems	<input type="checkbox"/> Automatic Sprinkler Remodel <input type="checkbox"/> or New <input type="checkbox"/>	<input type="checkbox"/> Flammable Liquids # of tanks _____	<input type="checkbox"/> Flow Test
<input type="checkbox"/> LPG Tank(s) # of tanks _____	<input type="checkbox"/> Spray Booth spraying & dipping	<input type="checkbox"/> Tents/Canopies complete Tent Handout	<input type="checkbox"/> Explosives Storage or Use	Name of Water District: _____
<input type="checkbox"/> Special Effects	<input type="checkbox"/> Plan Review	<input type="checkbox"/> Knox Box	<input type="checkbox"/> Other _____	Contact # for Water District: _____

Description of project: _____

If additional space is needed please attach to this Application

Materials be stored: ☐ Yes ☐ No

Containers and quantities: _____

Customer/Applicant Information

Phone #: _____

Phone #: _____

Address: _____ State: _____ Zip: _____

Contractor License #: _____ Class: _____ Fax #: _____

Contact Person: _____ Cell #: _____

Email Address: _____

Permit applications may be submitted in person or mailed to:
Kern County Fire Department
2820 M St.
Bakersfield, CA 93301
Attn: Fire Prevention-Permits

Visa and MasterCard Accepted
Please include a check made payable to **Kern County Fire Department**

Permit Number: _____

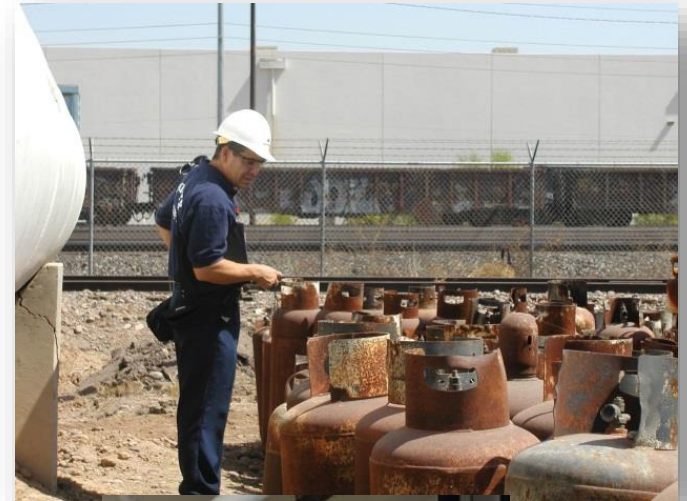
Signature _____

KCFD 200 (0717) **Also submit site plans, construction plans and specifications**

Inspections

§107

- Inspectors check the installation to confirm conformance with the approved design documents
- Inspectors evaluate fire protection systems to confirm installation according to design standards
- An inspection may be required for licensing of day care and health care occupancies
- An inspection is required before an operational permit can be issued



Right of Entry

- Permission to perform the inspection must be obtained from the property owner, tenant or an individual authorized to allow entry onto the property
- A property owner can refuse an inspector's entry into a building

1. Identify yourself – carry ID in addition to uniform
2. Obtain permission and consent from a responsible individual with the business, building or site
3. Inform the individual of the purpose of the inspection
4. A business may request a copy of the legal basis for an inspection – IFC §106 and §104.3
5. Once consent is granted, the inspection can proceed

4th Amendment to the U.S. Constitution

Testing and Operation

§108.2

- Fire protection and life safety systems are inspected, tested and approved at initial installation
- Owner is responsible to maintain the operational readiness of the system
 - Many systems require annual inspection or testing
 - Owner must maintain records
- Records must be available for review by FCO



Unsafe Buildings

§111

- The FCO has the authority to require corrections to bring a building or system into compliance when a serious fire or life safety threat is found
- This authority extends to systems or items regulated by the IFC
- If the violation constitutes an imminent danger, the FCO is authorized to require the partial or complete evacuation of the building and prohibit re-entry



Photo courtesy of New Orleans Fire Department, LA

Stop Work Order

§112

- The FCO is authorized to issue a Stop Work Order
- In the IFC, Stop Work Orders can be issued for:
 - Work performed without obtaining the required Operational or Construction permits
 - Work that has concealed components which have not yet been inspected
 - Work regulated by the IFC
- Stop Work Orders are an immediate order to stop

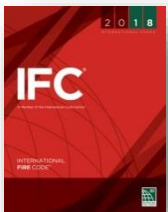


Board of Appeals

§109

Appendix A contains
guidelines on establishing
a Board of Appeals

- The FCO is responsible for interpretation of the IFC
- A property or business owner has the right to legally challenge those interpretations
- The Board of Appeals evaluates the information against the intent of the code and renders a decision regarding the interpretation of the code
- The appellant must claim the FCO has erred in interpreting the code or has wrongly applied a code section
- The Board of Appeals cannot waive code requirements





Part I – Code Administration & Enforcement

1. T **F** The design and use of a building or property can never stray from the requirements found in the IFC.

False

The design and operation must meet the *intent* of the code; alternate methods approved by the fire code official are allowed.

2. T **F** All of the I-Codes work separately and independently of each other.

False

The I-Codes work as a set of codes, each applying to a specific portion of the facility.





Part I – Code Administration & Enforcement

3. After a building receives a Certificate of Occupancy, how often does the IFC require fire inspections to be conducted?

As often as deemed necessary
IFC §107.2

4. When the FCO arrives to conduct an inspection, the building owner refuses to allow the inspection. Does the FCO have the authority to demand the inspection? What options are there?

- Owner has the right to refuse the inspection
- FCO cannot demand inspection
- FCO can obtain an inspection warrant (administrative warrant)

IFC §104.3



General Safety Requirements



Combustible Materials

§304

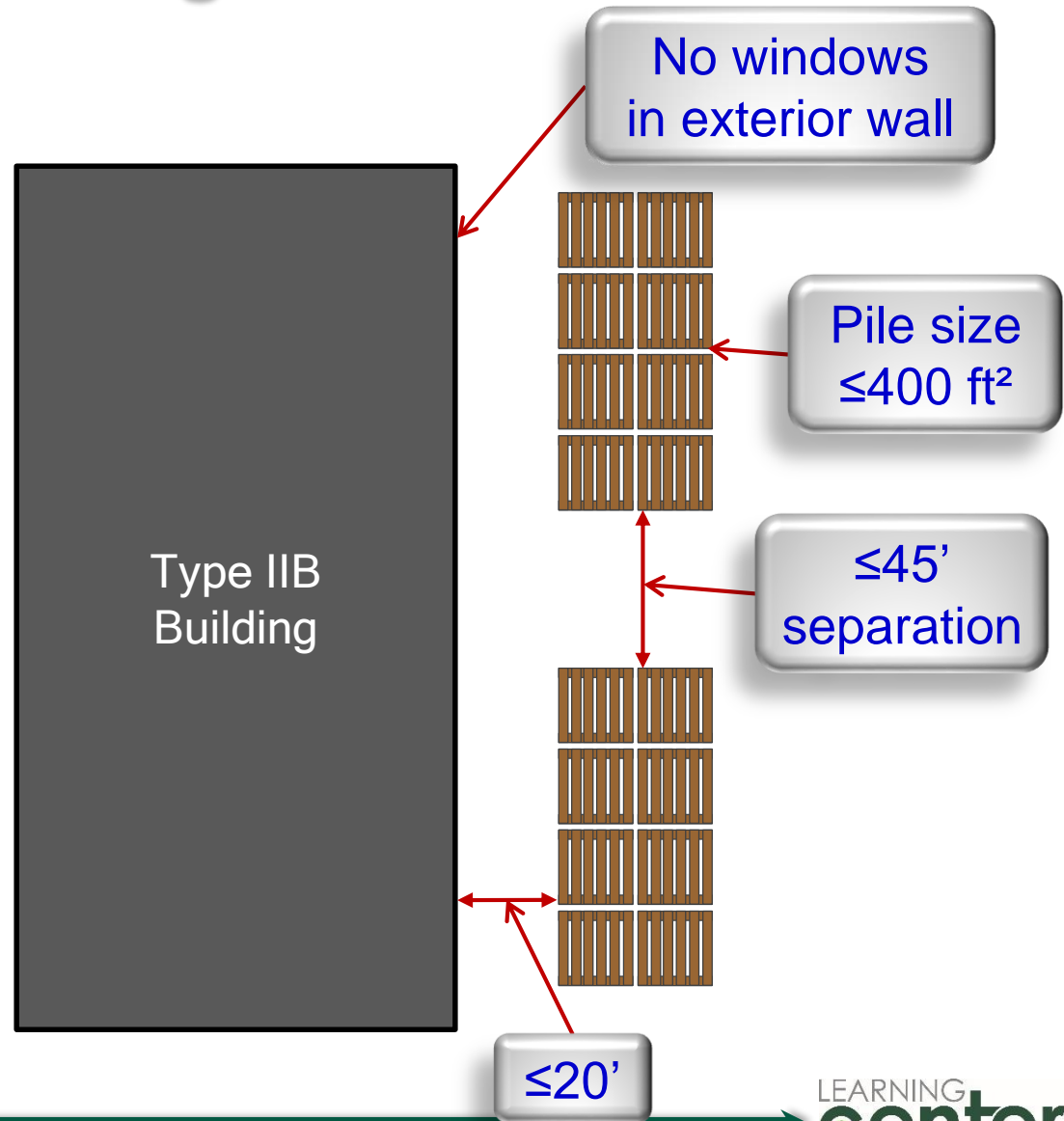
- Orderly storage
- Located away from ignition sources
- Separation from means of egress
- Separation from concealed spaces
- Dumpsters located $\geq 5'$ from combustible construction, wall openings and combustible roof eaves



Outdoor Pallet Storage

§315

- Wood pallets
 - Table 315.7.6(1)
- Plastic pallets
 - Table 315.7.6(2)
- Listed plastic pallets should be considered under the table for wood pallets



Open Flames

§308

- Separation of uses and activities involving potential sources of open flames from combustible materials

- Pour 1 ounce at a time
- In the immediate vicinity of the table being served
- Not transported or carried while burning
- Wet towel immediately available

IFC §308.1.8

- Liquid- or solid-fueled lighting devices of >8 oz. must self-extinguish if tipped over
- Devices must not leak at a rate >0.25 teaspoon per minute if tipped over

IFC §308.3.1



Vacant Premises §311

- Safeguarding vacant buildings
 - Openings into the structure are protected from unauthorized entry
 - Hazardous materials removed
 - Fire protection systems should be in service

- 24" x 24"
- Red background
- White reflective stripes
- White reflective border

This can be difficult in:

1. Cold weather environments can freeze water
2. Hot, humid environments can cause corrosion in electronic components

FCO can permit systems to be disabled, provided that combustibles and haz mat are removed, and the building does not represent a hazard – IFC §311.2



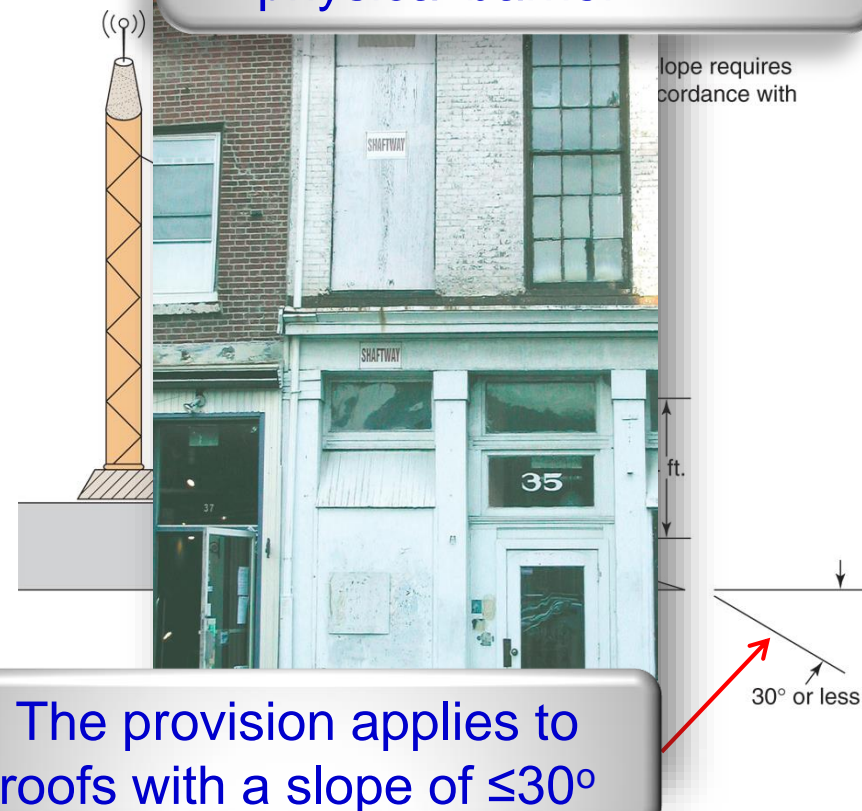
Hazards to Fire Fighters

§316

- Trap doors must be closed
- Shaftway markings
- Obstructions <7' above the surface of a roof:
 - Must not create an obstruction, or
 - Must be protected or identified to emergency responders

Methods of protection:

- 2" white protective collar
- physical barrier



The provision applies to roofs with a slope of $\leq 30^\circ$

Indoor Display of Vehicles

§314

- ≤ 5 gallons or $\frac{1}{4}$ tank of fuel
- Fuel tank fill opening closed and sealed
- No fueling or defueling inside building
- Batteries disconnected?
 - Depends on vehicle and built-in safety features



Rooftop Gardens and Landscaped Roofs

§317

- Landscaped portion of the roof is limited in size
 - Maximum area of 15,625 ft²
 - Maximum dimension of 125'
- Additional landscaped areas
 - Separated by 6'
 - Roof rating of separation must be Class A



- When a standpipe is already provided in the building, it must be available to all landscaped areas
- Landscape maintenance plan required

Mobile Food Preparation Vehicles

§319

- Permit required
- Cooking oil storage
 - Metallic tanks or listed nonmetallic
- Fire-extinguishing system if grease-laden vapors are produced
- Fuel gas storage



Public Assemblies and Events

§403

- Public assemblies and events can occur inside buildings or outdoors
- Public assemblies in other than Group A or E, the FCO can require a public safety plan
 - Fire apparatus access
 - Emergency medical response
 - Law enforcement
- Fire watch
- Crowd Managers



Crowd managers required when:

- OL >500 inside a building
- OL >1,000 for place of religious worship
- OL >1,000 for outdoor event

Fire Safety and Evacuation Plans

§404

- Fire Safety & Evacuation Plans are required in:
 - Group A except for place of religious worship with OL of $<2,000$
 - Group B ambulatory care facility
 - Group B, F and M with an OL ≥ 500 or an OL >100 above or below the level of exit discharge
 - Group F – if required in pallet manufacturing or recycling facility
 - Group E, H, I, R-1, R-2 college & university buildings, and R-4
 - Covered malls and open malls $>50,000$ ft²
 - Underground buildings
 - Group A, E or M with an atrium
 - High-rise buildings of any occupancy
 - Buildings using occupant evacuation elevators
 - High-piled storage $>500,000$ Class I – IV, $>300,000$ high-hazard



Table 405.2
Page 70

Table 405.2 – Fire and Evacuation Drill Frequency and Participation

GROUP OR OCCUPANCY	FREQUENCY	PARTICIPATION
Group A	Quarterly	Employees
Group B ^b	Annually	All occupants
Group B ^{b,c} (ACF)	Annually	Employees
Group B ^b (clinic, outpatient)	Annually	Employees
Group E	Monthly ^a	All occupants
Group F	Annually	Employees
Group I-1	Semiannually on each shift	All occupants
Group I-2	Quarterly on each shift ^a	Employees
Group I-3	Quarterly on each shift ^a	Employees
Group I-4	Monthly on each shift ^a	All occupants
Group R-1	Quarterly on each shift	Employees
Group R-2 ^d	Four annually	All occupants
Group R-4	Semiannually on each shift ^a	All occupants

- a. In severe climates, the FCO shall have the authority to modify the emergency evacuation drill frequency.
- b. Emergency evacuation drills are required in Group B buildings having an occupant load ≥ 500 persons or >100 persons above or below the lowest level of exit discharge.
- c. Emergency evacuation drills are required in ambulatory care facilities in accordance with §403.3.
- d. Emergency evacuation drills in Group R-2 college and university buildings shall be in accordance with §403.10.2.1. Other Group R-2 occupancies shall be in accordance with §403.10.2.2.





Part II

General Safety Requirements

1. **T** F Open flame devices are prohibited in sleeping units of Group R-2 dormitories.

True
IFC §308.4.1

2. The fuel tanks in vehicles on display in a mall are limited to 5 gallons, or 1/4 capacity of the tank.

IFC §314.4





Part II

General Safety Requirements

3. A Fire Safety and Evacuation Plan is required in a Group F occupancy when the total occupant load in the building is 500 or more, or when there are 100 or more above or below the level of exit discharge. **IFC §403.6**
4. In the above Group F occupancy, evacuation drills are required annually, and all employees must participate in the drill.

IFC Table 405.2





Site and Building Services



Fire Apparatus Access Roads

§503

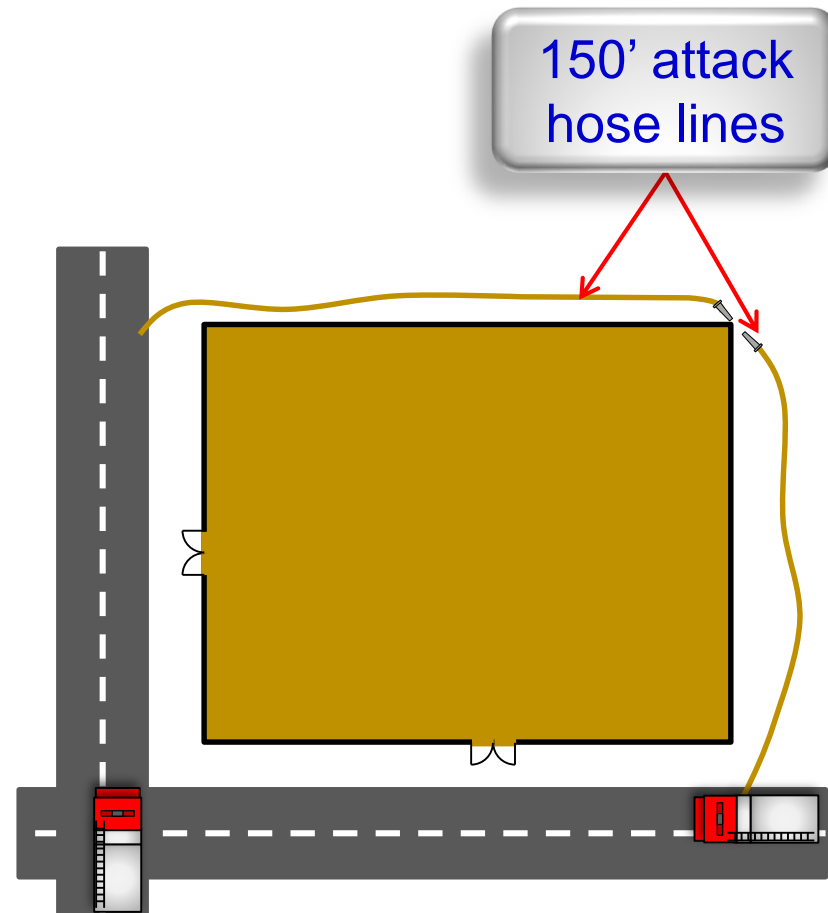
- A fire apparatus access road is the road from the fire station to a facility, building or location
- Access road requirements are typically applied to private property
- Public roads are typically constructed to specifications developed by Public Works or Transportation Engineering department



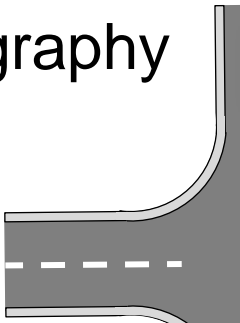
Fire Apparatus Access Roads

§503.1

- Fire apparatus access roads are required for any facility, building or portion of a building constructed or moved into the jurisdiction
 - Located $\leq 150'$ of all portions of the facility and the exterior walls of the 1st story of the building as measured by an approved route



Fire Apparatus Access Roads

- Modifications to the 150' distance
 - Sprinklers
 - Alternative protection because of topography limitations
 - ≤ 2 Group R-3 or U occupancies
- 
- A decorative graphic in the bottom right corner of the slide. It depicts a road intersection or a curved road section. The road is shown in a dark gray color with a dashed white line indicating a lane or center line. The road curves upwards and to the right, meeting a vertical wall or boundary. The overall style is simple and schematic.

Road surface

Maximum
grade

Minimum road
height 13'6"

Turn around

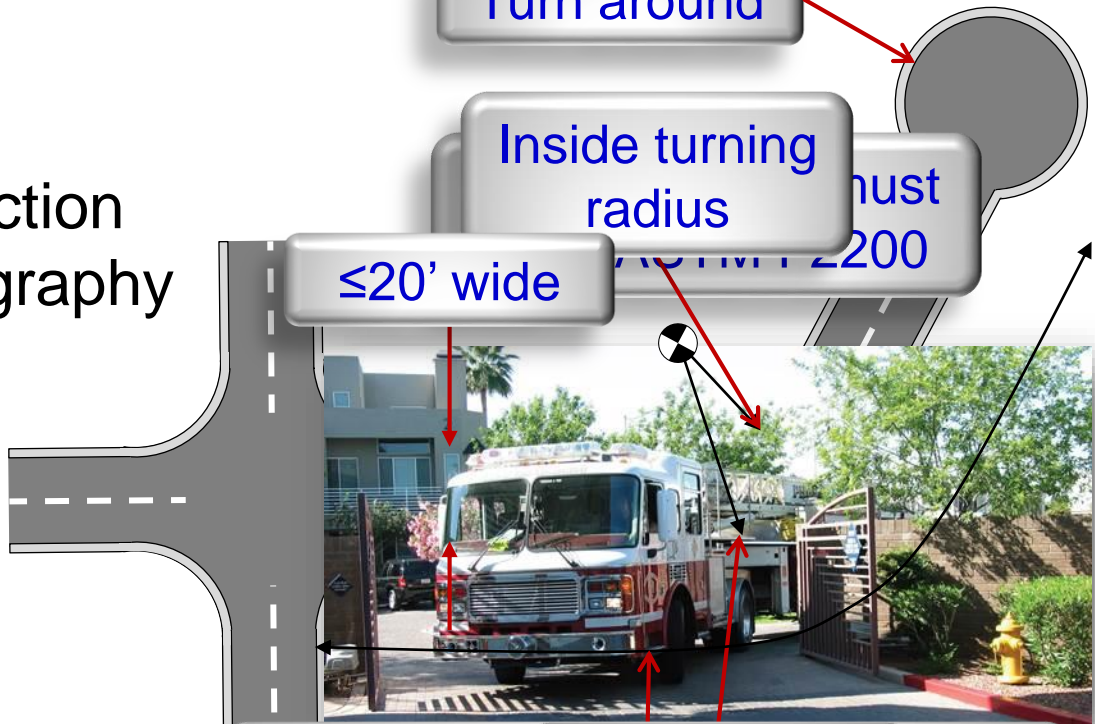
Inside turning radius must

≤20' wide

Approved to
dead-end

Outside \rightarrow needed for
turning radius length

Specified by j



Fire Apparatus Access Roads

§503

- Design and construction
 - Appendix D

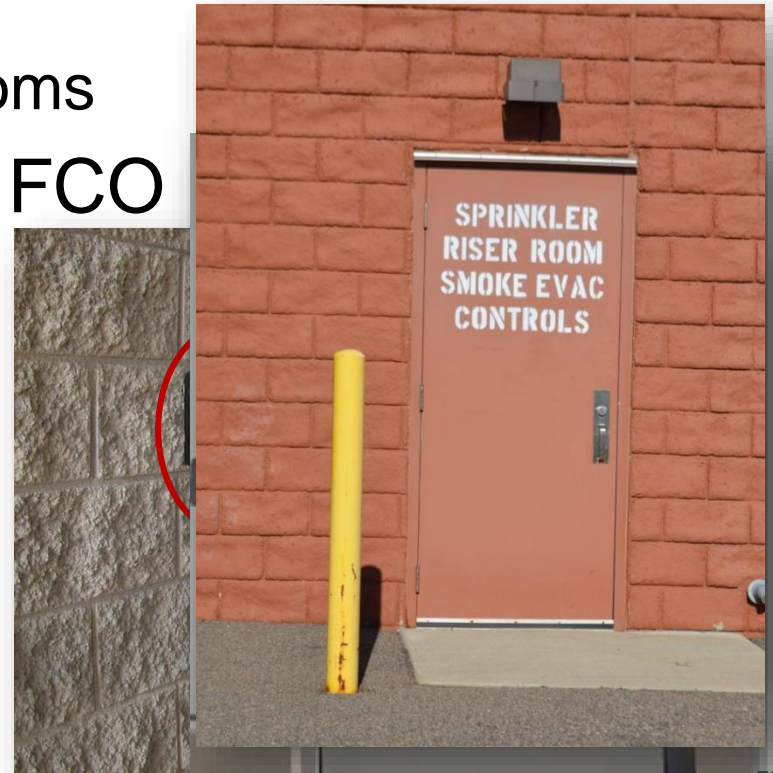
Many of the specific dimensions can be included in Appendix D....
if it is adopted

Requirement	Chapter 5	Appendix D
Minimum road width	20'	20'; 26' for aerial apparatus access
Maximum grade	As required by FCO	10%
Minimum turning radius	As required by FCO	As required by FCO
Turnaround design	Must be approved	Specific design criteria
Angle of approach/departure	As required by FCO	As required by FCO
Road surface	All weather	Asphalt, concrete or other approved surface
Road design	Support load of fire apparatus	Designed for vehicles with a weight of 75,000 pounds
Aerial apparatus access	Not specified	Buildings >30' in height
Fire lane signs	Must be approved	Minimum size, reflective background, specific design
Multiple access into subdivisions	When required by FCO	>30 units unless sprinklered

Access to Buildings

§504

- Required exterior doors or openings must be maintained accessible for use by FD
 - Identification of riser rooms, electrical and mechanical rooms
- Key box – approved by the FCO
 - Location of the key box
 - Number of keys
 - Manufacturer of the key box
- Stairway to roof
 - Required when ≥ 4 stories
 - Stairway must be identified



Hazards to Firefighters

§504, §316

- Doors to shaftways must be marked
 - Interior doors
 - Exterior doors
- Security devices which could harm or injure FF are prohibited
- Trapdoors or scuttles must be closed when not in use



Fire Protection Water Supplies

§507

- As part of construction, facilities or buildings require a fire water supply capable of delivering the required fire flow for manual fire-fighting operations
- Determining required water supply
 - Appendix B
 - IWUIC
 - NFPA 1142
 - Iowa State University
 - National Fire Academy



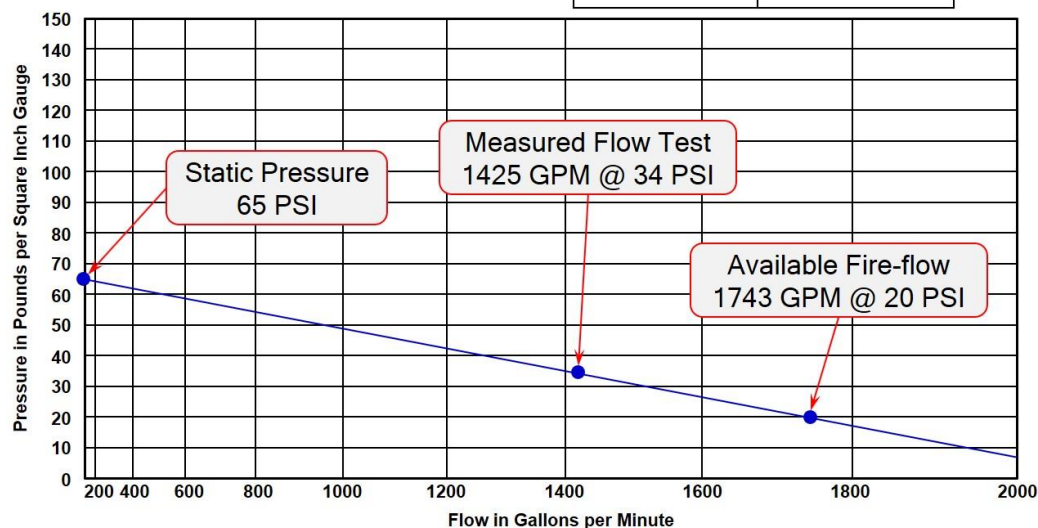
Water Supply

- Relationship of fire sprinkler requirements and fire-flow requirements are addressed in Appendix B

- Both must be met
- Do not combine
- Water supply must be able to provide both, but not simultaneously

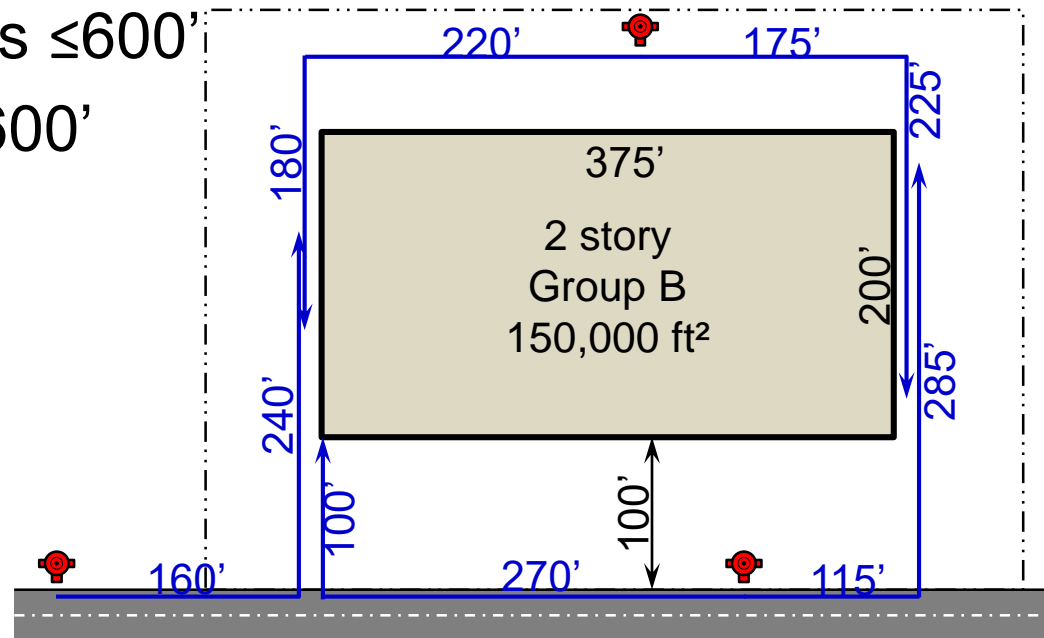
Water Supply Curve

Flow Test Data	
Date	January 4, 2017
Static Pressure	65 PSI
Measured Flow	1425 GPM
Residual Pressure	34 PSI



Water Source §507

- Tank, reservoir, pressurized water system
- Hydrant (or tank connection) within 400' of the 1st floor exterior walls of the building
 - Sprinklered buildings $\leq 600'$
 - Group R-3 and U $\leq 600'$
 - Add hydrants



Water Source

- System must be tested and maintained
- NFPA 25
 - Annual flow test and maintenance of private fire hydrants
 - Flow test private fire protection water mains every 5 years
- Minimum 3' clearance around hydrants
- Protection of hydrants required where subject to vehicle impact



Emergency Responder Radio Coverage

§510

- Emergency responder radio coverage provisions are concerned with the reliability of portable radios used inside buildings
- Requires that all buildings have approved radio coverage in 95% of the building
 - Digital audio quality is evaluated
 - DAQ 3.0
- If radio signals are not adequate, owner must install equipment to enhance signal



Emergency Responder Radio Coverage

§510

- IFC provides performance criteria for complying with radio coverage requirements
 - Does not specify solution, but allows use of any appropriate technology
- Secondary power required
- Testing and maintenance requirements
- Must meet FCC compliance



Fuel-Fired Appliances

§603

- Apparatus or device using fuel gas or fuel oil
- Equipment must be installed in accordance with manufacturer's instructions
- Modifications must be in accordance with manufacturer's requirements
- Access is required so equipment can be maintained

Waste oil is used as the fuel in these burners

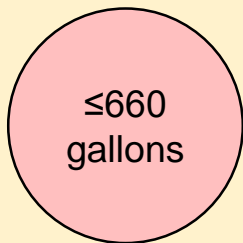


*Photo courtesy of
Clean Burn Energy Systems
Leola, PA*

Fuel Oil Inside Buildings

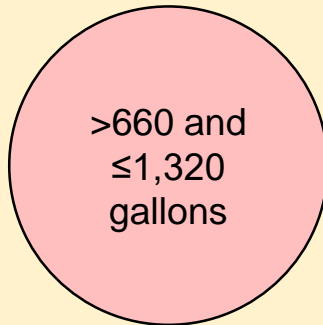
§603.3

- Aggregate fuel oil storage ≤ 660 gallons is allowed inside building in
 - Tanks allowed by Ch 57, or
 - Tanks integral to fuel burning equipment



Tank listed to:

- UL 80, or
- UL 142, or
- UL 2085

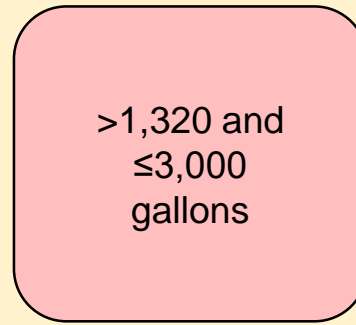


Tank listed to:

- UL 142, or
- UL 2085

AND

building is sprinklered
with NFPA 13 system



Tank listed to:

- UL 2085

AND

room is sprinklered
with NFPA 13 system



Fuel-fired Appliances *Inside* Buildings

§603.4

- Portable unvented fuel-fired appliances inside buildings
 - Prohibited in Groups A, E, I and R
 - Listed and approved heaters allowed in 1- and 2-family dwellings
 - Cannot be located inside sleeping rooms, bathrooms or closets



Portable Gas-Fired Heaters

Outside Buildings

Photo courtesy of
Infrared Dynamics,
Yorba Linda, CA

- Portable outdoor heaters allowed in outdoor locations
- Listed to ANSI Z83.26 Standard for Gas-Fired Outdoor Infrared Patio Heaters
 - Requires CGA 790 gas valve

5' separation to:

- Exits, or exit discharge
- Building wall
- Combustible decorations



center

Mechanical Refrigeration

§605

- IFC regulates refrigeration systems with
 - Toxic refrigerants
 - Ammonia
 - Flammable refrigerants
 - New – Class 2L
 - “Lower flammability”
 - Still treated as flammable

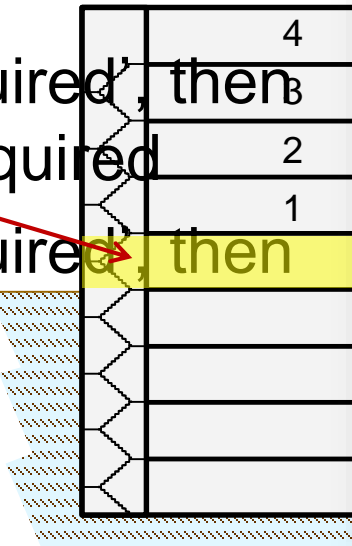


Elevators

§606

- Elevator required in new buildings with ≥ 4 stories above or below the LED
- Phase I and II required for all new elevators
- If elevators are 'required', then standbys are required
- If elevators are 'required', then 1 is sized for gurney

Level of
Exit Discharge



Commercial Kitchen Hoods

§607

- Commercial cooking appliances require a local exhaust ventilation system to remove heat, vapors, steam, smoke and odors
- Type I hoods are designed to also remove of grease-laden vapors and smoke
- Extinguishing system is required when Type I hood is required



Commercial Hood Maintenance

Table 607.3.3.1

Type of Cooking Operation	Frequency of Inspection
High-volume cooking operations such as 24-hour cooking, charbroiling, or wok cooking	3 months
Low-volume cooking operations such as places of religious worship, seasonal businesses, and senior centers	12 months
Cooking operations utilizing solid-fuel-burning cooking appliances	1 month
All other cooking operations	6 months

System is cleaned when inspection finds excess grease



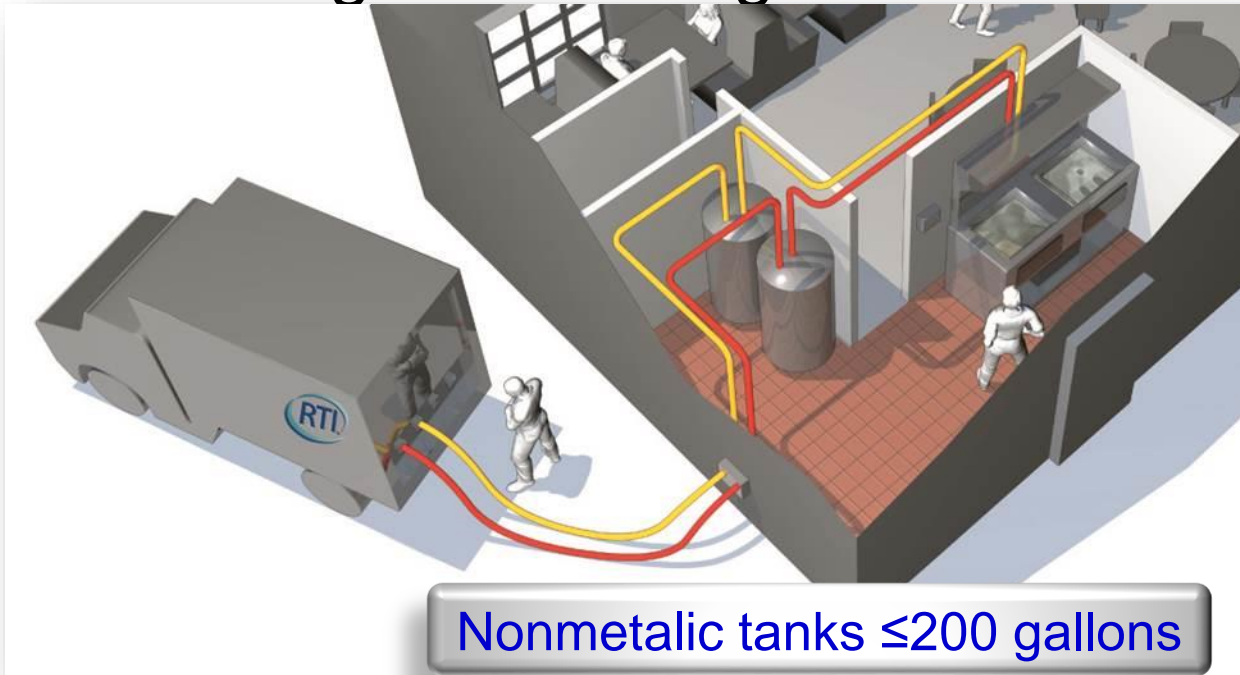
DO NOT REMOVE																							
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC												
2012		2013		2014		Certificate # 1208852																	
KITCHEN EXHAUST SYSTEM CERTIFICATE OF SERVICE																							
Flue Steam, Inc.																							
(310) 636-8361																							
5734 Bankfield Ave, Culver City, CA 90230																							
Frequency		30	60	90	other		served by:																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31							INACCESSIBLE AREAS ARE NOTED ON INVOICE										

Courtesy of Flue Steam, Inc., Culver City, CA

Commercial Kitchen Cooking Oil Storage

\$608

- Storage of cooking oil in



Courtesy of Restaurant Technologies, Inc., Mendota Heights, MN

Nonmetallic tanks can be listed without emergency vent



Courtesy of Darling International Inc. Irving, TX

Discussion Activity





Final Reflection

Reflect on the day. What will you take back to the job and apply?

- **What?** What happened and what was observed in the training?
- **So what?** What did you learn? What difference did this training make?
- **Now what?** How will you do things differently back on the job as a result of this training?



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