CITY OF LONG BEACH

DEPARTMENT OF FIRE

925 Harbor Plaza, Suite 100 • Long Beach, CA 90802 • Telephone (562) 570-2500 • FAX (562) 570-2506

DAVID W. ELLIS
FIRE CHIEF

Date: January 30, 2007

To: Members of the Public Safety Committee

From: David W. Ellis, Fire Chief
Suzanne Frick, Director of Planning and Building

Subject: **Report on Fire Suppression and Fire Alert Requirements**

DISCUSSION

As a result of the devastating Paradise Gardens Apartment fire of December 8, 2006, the City Council requested the Fire Marshal and the Building Official to complete an evaluation of the current fire and building code requirements pertaining to fire sprinklers and fire alerting systems within the City of Long Beach.

At the City Council meeting of December 19, 2006, the City Council directed staff to report back on existing fire codes in the City and referred it to the Public Safety Committee.

The attached report documents the impact of fire sprinklers and fire alerting systems and the effectiveness of such systems on fire and life safety and recommends amendments to existing regulations. A phase-in timeline for implementation is also proposed.

This letter was reviewed by Deputy City Attorney Gary Anderson and Budget Management Officer David Wodynski on January 19, 2007.

TIMING CONSIDERATIONS

Council action on this item is not time critical.

FISCAL IMPACT

The estimated cost to install fire sprinklers and alarm systems will vary by project for affected property owners. There is no immediate cost to the City. However, increased staffing for plan review and inspections could be required in future years, but would be offset by user fees.

IT IS RECOMMENDED THAT THE COMMITTEE:

Concur with the proposal, refer report to the City Council and recommend that the City Council approve the recommendations.

APPROVED:

GERALD R. MILLER
CITY MANAGER

ATTACHMENT

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REPORT ON FIRE SUPPRESSION AND FIRE ALERT REQUIREMENTS

Executive Summary

As a result of the devastating Paradise Gardens Apartment fire of December 8, 2006, the City Council requested the Fire Marshal and the Building Official to complete an evaluation of the current fire and building code requirements pertaining to fire sprinklers and fire alerting systems within the City of Long Beach.

This report documents the impact of fire sprinklers and fire alerting systems and the effectiveness of such systems on fire and life safety and recommends amendments to existing regulations.

Historical Overview

The Long Beach Municipal Code has adopted both the 1997 Uniform Building Code and 2000 Uniform Fire Code with 2001 California State and local amendments. The Fire Department enforces the Fire Code while the Department of Planning and Building enforces the Building Code.

The Uniform Fire and Building Codes are publications that are recognized nationally and are published on a triennial basis. The codes are reviewed and adopted by the State and may be amended or revised by the local enforcing agencies to meet the needs of the community. Local jurisdictions may amend the codes as long as the amendments are not less restrictive than the published code and appropriate findings are made to justify such amendments.

As the codes develop through the years, the tendency is for the most recently published code to become more restrictive than in the prior editions. The main catalyst for such code changes tend to be incidents of a significant nature that bring to light code issues that need to be revised to save lives and reduce property damage.

The requirements for fire sprinklers and fire alerting systems are specified in both the Building and Fire Codes. The requirements for such systems vary according to a number of building design features such as:

- Occupancy type
- Construction type
- Building height and area
- Hazardous conditions and use of the occupancy

The model codes have progressed since the 1960's to require fire sprinklers and fire alerting systems in residential and non-residential occupancies. For example, residential occupancies constructed in the 1960's were required to comply with only minimal code standards as compared with today's requirements. (Attachment A)

The current codes adopted by the City of Long Beach, herein referred to as the Long Beach Municipal Code, for new construction are not as restrictive as other cities when it comes to the requirements of fire sprinklers. The Long Beach Municipal Code currently only has a minimal number of more stringent requirements than the model State code. For example, retail sales areas are required to be fire sprinklered at 5,000 square feet or more per the Long Beach Municipal Code as compared to the model State code requirement of 12,000 square feet. In addition, the municipal or model State codes do not address the issue of the retrofitting of fire sprinklers in any existing occupancy including multi-family residential or high-rise buildings. The only upgrades currently realized are on a voluntary basis or when a change of occupancy is made.

The Long Beach Municipal Code or model State code does not require the retrofit of fire alerting systems in any existing occupancy including multi-family residential or high-rise buildings. The current method of upgrading a fire alerting system is on a voluntary basis.

A number of cities such as the City of Los Angeles, San Diego, San Francisco, and San Jose have adopted a variety of retrofit fire sprinkler ordinances for existing high-rise buildings. In fact, the City of San Jose fire sprinkler ordinance of 1990 required **all** high-rise buildings to be fire sprinklered within three years. The current Long Beach Municipal Code does not adopt such an ordinance requiring fire sprinklers in existing high-rise building.

A high-rise building is defined as any building with floors used for human occupancy over 75 feet in height from the lowest point of fire department access. The hazards associated with high-rise buildings include:

- Height of fire floor
- Number of firefighting resources required
- Delays in deploying equipment due to height
- Exiting delays due to height
- Number of occupants and fuel load per floor
- Smoke and fire spread

Currently there are over 70 high-rise buildings in the City of Long Beach, which include office buildings, residential apartments, condominiums and hotels. Records on file estimate that only 54% of these high-rise buildings are currently fire sprinklered.

Fire Sprinklers

The installation of fire sprinkler systems is of paramount importance for all occupancies but especially for residential occupancies. According to the U.S. Fire Administration, the residential fire problem represents approximately 80% of all fire deaths and 76% of the injuries to civilians.

The U.S Fire Administration reports that fires in residences have taken a high toll of life and property. In 2005 there were:

- 396,000 residential fires
- 3,055 civilian fire deaths
- 13,825 civilian fire injuries
- $6.8 billion in property damage

Properly installed and maintained automatic fire sprinkler systems help save lives and property. Because fire sprinkler systems react so quickly, they can dramatically reduce the heat, flames and smoke produced in a fire. Together with smoke detectors, sprinklers cut the risk of dying in a home fire by 82%, according to the National Fire Protection Association (NFPA).

Fire sprinklers are extremely effective in combating fire in residential and non-residential occupancies; according to NFPA fire sprinklers are 96% effective in the control of fire. In fact, there has never been a documented case of a fire killing more than two people in a completely sprinklered public assembly, educational, institutional or residential building where the fire sprinkler system was working properly.

Property damage is also greatly reduced in sprinklered buildings. In fact, NFPA records indicate that property damage losses are 85% less in residences with fire sprinklers.

In addition to the fire safety benefits of fire sprinklers other advantages of installing fire sprinklers include the assurance of a safer environment for one's family, protection of investment and irreplaceable family possessions and, in some instances, lowers insurance rates of 5 to 20 percent. (Attachment B)

Fire Alerting Systems

The fire alerting system, or commonly referred to as a fire alarm system, is designed to provide early notification to occupants of smoke or fire within an area or occupancy. The systems are **not** designed to extinguish a fire but simply notify the occupants that a fire condition exists.

The majority of required fire alarm systems are installed in multi-family residential, assembly, educational and convalescent occupancies where early notification is required for evacuation purposes.

One of the problematic areas with existing fire alarm systems is that a significant number of these systems do not meet current standards for audibility, visual notification and smoke detector locations.

A fire alarm system is a key element among fire protection features of any building. Due to the fact that most fire deaths in the United States result from building fires, the

use of fire alarm systems in buildings can help to significantly reduce the loss of life from fire.

Code Comparison to Other Jurisdictions

The model codes have historically been conservative on the subject of fire sprinklers in residential type occupancies. Many jurisdictions have adopted local ordinances that are more restrictive than the model codes.

An analysis was conducted of various cities throughout California regarding local requirements for fire sprinklers and fire alerting systems for both new and existing occupancies. The analysis found that of the cities that responded, over 30 cities have adopted fire sprinkler ordinances that are more restrictive than the model codes. The major cities with such ordinances have been provided. (Attachment C)

For example, the City of Glendale adopted a fire sprinkler ordinance in 1989 requiring **all** new construction to be fire sprinklered. They also adopted in 1989 a retrofit fire sprinkler ordinance for existing residential and non-residential occupancies when building modifications are made.

In regards to fire alarm systems, the City of Los Angeles requires buildings with existing fire alarm systems to be upgraded to comply with current code requirements throughout the building when the fire alarm panels are required to be replaced due to obsolescence.

The issue of adopting more restrictive code requirements for fire protection systems is a common practice and consistent with other jurisdictions' attempts to decrease fire fatalities and property damage in their respective communities.

Opposition Discussion

Despite the fact that fire sprinklers have proven to save lives and property, opposition to adopting a more restrictive ordinance than the model codes for either new construction or for existing structures can be expected from owners, developers and other interested parties.

For new construction developments, opposition can be anticipated from developers and owners who may incur increased construction cost associated with the installation of fire sprinklers.

In existing buildings, owners and tenants may argue against the additional cost and disruptions associated with the retrofit installation of fire sprinklers and fire alarm systems. Building owners will have logistical issues such as gaining access to occupied tenant areas, possible asbestos abatement, possible tenant relocation, noise disruptions and other inconveniences.

In order to assist the public with compliance with any proposed requirements it is essential that a reasonable time frame be established that takes into consideration the financial and logistical problems associated with retrofitting existing buildings. An extended time frame will enable the owner of an existing building to not only budget the cost associated with fire sprinklers, but with scheduling contractors, ensuring tenant access and possible business interruption.

Estimated Cost of Installation

The estimated cost of installing fire sprinklers will vary between new and existing construction. The following cost estimates for fire sprinklers in new construction projects are as follows:

New single/two family	$2.50 to $3.00 per square foot
New multi-family residential	$3.00 to $4.00 per square foot
New non-residential	$4.00 to $5.00 per square foot

*New high-rise occupancies are not included due to mandatory fire sprinkler requirements per model code.

The following cost estimates for fire sprinklers in existing occupancies are as follows:

Existing single/two family	$3.00 to $4.00 per square foot
Existing multi-family residential	$4.00 to $5.00 per square foot
Existing high-rise	$5.00 to $6.00 per square foot

*An estimated cost of $48,000-$60,000 would be required for a three story 12-unit apartment building.

The indirect cost not estimated in the calculations will vary depending on the building features such as area, height, type of construction, water meter fees and location to available water main connections and associated piping.

For existing occupancies additional cost may also be incurred due to the age of the occupancy and for such items as asbestos abatement and property vacancies due to the installation of new fire protection systems, possible tenant displacement and business interruption.

The estimated cost of installing fire alarm systems will vary for high-rise and non-high-rise occupancies. The following cost estimates for fire alarm systems are as follows:

Existing non-highrise	$1.00 per square foot
Existing highrise	$1.25 per square foot

*New high-rise occupancies are not included due to mandatory fire alarm requirements per model code.

As with fire sprinkler installations, an indirect cost not estimated in the calculations will depend upon the buildings features such as area, height, and type of construction.

City Fiscal Impact

The funding for additional staffing required to support the proposed ordinances would be offset by the collection of plan review and inspection fees. The plan review and inspection services for fire sprinklers installation are conducted exclusively by the Fire Department.

For the installation of fire alarm systems, additional staffing required to support the proposed ordinances would be offset by the collection of plan review and inspection fees. The plan review and inspection services for fire alarm installations are conducted by both the Fire Department and Department of Planning and Building.

Recommendation

It is respectfully recommended that the following actions be implemented:

New Construction – Fire Sprinklers

1. Require all ***new multi-family (3 or more units) residential, hotels, motels*** and similar buildings to be protected by fire sprinkler systems in accordance with applicable National Fire Protection Association standards. (Current code requires fire sprinklers at 5 or more units)

2. Require all ***new single-family dwellings and duplexes*** greater than 4,000 sq. ft. or more than 2 stories in height to be protected by fire sprinkler systems in accordance with applicable National Fire Protection Association standards.

3. Require all ***new commercial, industrial and non-residential*** buildings that require 2 or more exits or that are greater than 3,000 sq. ft. to be protected by fire sprinkler systems in accordance with applicable National Fire Protection Association standards.

Existing Construction – Fire Sprinklers

4. Require all ***existing multi-family residential, hotels, motels*** and similar buildings containing fifty or more units to be retrofitted with fire sprinkler systems in accordance with applicable National Fire Protection Association standards, ***within a period not to exceed 5 years.***

   Require all ***existing multi-family (3 or more units) residential, hotels, motels*** and similar buildings less than fifty units to be retrofitted with fire sprinkler systems in accordance with applicable National Fire Protection Association

standards **only when** (1) any addition is equal to or greater than 5,000 sq. ft. or, 25% of the existing square footage of the building or (2) or when any alteration, repair, rehabilitation is equal to or greater than 25% of the replacement cost of the building, over a period of three years.

5. Require all ***existing single-family dwellings and duplexes,*** when additions are made and the total sq. ft. is greater than 4,000 sq. ft. or more than 2 stories in height, to be protected by fire sprinkler systems in accordance with applicable National Fire Protection Association standards except when the increase in square footage of the building is 10% or less over a period of three years.

6. Require all ***existing high-rise*** (over 75 feet) buildings as defined by the California Building Code to be retrofitted with fire sprinklers in accordance with applicable National Fire Protection Association standards, ***within a period not to exceed 10 years.***

It is staff's recommendation that a period of ten years be established for the retrofit of fire sprinkler systems for high-rise buildings and five years for other occupancies. It is proposed that the installation would be phased with key benchmarks identified within the time frame.

Existing Construction – Fire Alarms

7. Require all ***existing multi-family (3 or more units) residential, hotels, motels,*** and similar buildings to be retrofitted with a fire alarm system in accordance with applicable National Fire Protection Association standards. The requirement to upgrade the existing fire alarm system to current code will be required at the time of replacement of the existing non-functioning fire alarm control panel.

8. Require all ***existing high-rise*** (over 75 feet) buildings as defined by the California Building Code to be retrofitted with a fire alarm system in accordance with applicable National Fire Protection Association standards. The requirement to upgrade the existing fire alarm system to current code will be required at the time of replacement of the existing non-functioning fire alarm control panel.

In regards to retrofit of fire alarm systems it is staff's recommendation that the requirement to upgrade the existing fire alarm system to current code be required at the time of the replacement of the existing fire alarm control panel, due to the lifespan of the panel and unavailability of replacement parts.

Conclusion

Fire sprinklers have been in existence for over 100 years and have proven to be an effective method of suppressing fire in all types of occupancies. The loss of life and

property in fire-sprinklered buildings is dramatically reduced compared to non-sprinklered buildings.

The events of December 8, 2006, however tragic in nature, can bring about a positive result. The current code requirements in effect, however compliant, should be revised in order to address life safety hazards associated with non-sprinklered occupancies.

The recommendations proposed are a starting point for making changes to the code. Additional changes can be made as necessary or on a triennial basis at the time of the regular readopting of the Fire and Building codes.

Enhanced fire protection requirements will provide critical improvements for those who live, work and play in the City of Long Beach.

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Chronological Timeframe of Fire & Life Safety Requirements From the Uniform Fire and Building Code 1964 to 2001

Fire Sprinkler Requirements

1964 - Wet Class II standpipes (1927 UBC had similar language) No sprinklers except in basements

1988 - More than 15 dwelling units or 3 or more stories require sprinklers and hotels 3 or more stories or containing 20 or more guest rooms

1991 - 16 or more dwelling units or 3 or more stories require sprinklers and hotels 3 or more stories or containing 20 or more guest rooms

2001 - 5 or more dwelling units or 3 or more stories require sprinklers and hotels 3 or more stories or containing 20 or more guest rooms

Fire Alarm Requirements

1964 - none

1970 - Apartments 3 or more stories in height and containing more than 15 units and every hotel 3 or more stories in height or 20 or more guest rooms (requirement is from the Uniform Fire Code only)

1973 - Apartments 3 or more stories in height and containing more than 15 units and every hotel 3 or more stories in height or 20 or more guest rooms

- Smoke detectors required in central locations near areas of access to sleeping rooms in apartment houses

1976 - Apartments 3 or more stories in height and containing more than 15 units and every hotel 3 or more stories in height or 20 or more guest rooms

- Smoke detectors required in central locations near areas of access to sleeping rooms in apartment houses and hotels

1982 - Apartments 3 or more stories in height or containing more than 15 units and every hotel 3 or more stories in height or 20 or more guest rooms

- Smoke detectors required in central locations near areas of access to sleeping rooms in apartment houses and hotels

1991 - Apartments 3 or more stories in height and containing 16 or more units and every hotel 3 or more stories in height or 20 or more guest rooms

- Smoke detectors required in central locations near areas of access to sleeping rooms in apartment houses and hotels

2001 - Apartments 3 or more stories in height and containing 16 or more units and every hotel 3 or more stories in height or 20 or more guest rooms

- Smoke detectors required in central locations near areas of access to sleeping rooms in apartment houses and hotels

INSURANCE PREMIUM DISCOUNTS FOR PROPERTIES PROTECTED BY FIRE SPRINKLER AND/OR FIRE ALARM SYSTEMS

Many insurance companies offer discounts to residential and commercial properties protected by automatic fire sprinklers and/or fire alarm systems. Discounts vary by individual underwriters and specific properties being protected but discounts to premiums generally range from 5-20%.

COMPANY	FIRE SPRINKLER DISCOUNT	FIRE ALARM DISCOUNT
STATE FARM	Full System = 10% Partial System = 5%	Monitored = 10% Local Only = 2%
FARMERS	Full System = 10% Partial System = 5%	Monitored = 5% Local Only = 3%
ALLSTATE	5%*	5%*
AAA	2%*	2%*

* Approximate premium discount contingent upon other fire & life safety building features such as roof type, locking hardware, distance to nearest fire station, and other. Discount may be more or less than figure provided.

Definitions:

1) Full System — All areas of the building are provided with fire sprinkler protection.

2) Partial System — All areas of the building are provided with fire sprinkler protection except for very specific areas such as bathrooms, closets, attics and other.

3) Monitored Fire Alarm System — A fire alarm system that alerts occupants to an emergency and is monitored 24 hours a day by an offsite company that notifies the fire department should an alarm condition be reported.

4) Local Fire Alarm System — A fire alarm system that locally alerts occupants of a building of an emergency, but does not transmit a signal offsite.

ATTACHMENT B

New Construction Fire Sprinklers

Jurisdictions	Non-Residential Occupancy	Multi-Family Occupancy	Single Family Dwelling	High - Rise
Burbank	All buildings, except U-1 Occupancy detached less than 500 sq. ft	All buildings, except U-1 Occupancy detached less than 500 sq. ft	All buildings, except U-1 Occupancy detached less than 500 sq. ft	Required by current model code - Typical
Culver City	All buildings except where the building is < 500 sq. ft.	All buildings except where the building is < 500 sq. ft.	All buildings except where the building is < 500 sq. ft.	
Fresno	≥ 5,000 sq. ft.			
Glendale	All	All	All	
Huntington Beach	> 5,000 sq. ft.	> 5,000 sq. ft.	> 5,000 sq. ft.	
Los Angeles	B, F-1, S-1, S-2, M in certain fire districts > 3000 sq. ft.		Hillside areas	
Newport Beach	> 5,000 sq. ft.	> 5,000 sq. ft.	> 5,000 sq. ft.	
Riverside City Fire	All, with some exceptions	All, with some exceptions	All, with some exceptions	
Roseville	≥ 3,600	≥ 3,600 and per CBC	> 2 stories in height and density requirements	
Santa Monica	All	All	All, except one story 2-car garages minimum 6 ft from residence	
Ventura County	All	All	All	
West Hollywood	All	All	All	
West Sacramento	> 4,000 sq. ft., ≥ 3 story, or ≥ 25 ft high	> 4,000 sq. ft., ≥ 3 story, or ≥ 25 ft high	> 4,000 sq. ft., ≥ 3 story, or ≥ 25 ft high	

ATTACHMENT C

Existing Construction Fire Sprinklers

Jurisdictions	Non-Residential Occupancy	Multi Family Occupancy	Single Family Dwelling	High - Rise
Beverly Hills	All buildings 5 stories or more or 55 ft high, except R-1 apts. And condominiums. Also 50% value or area or addition of 5000 sq. ft.			
Burbank	Additions where total area is > 5,000 sq. ft. and any alteration or repairs which are > 5,000 sq. ft or in 12 months are > 25% of replacement cost of building.	Additions where total area is > 5,000 sq. ft. or where alteration or repairs in 24 months are > 50% of the replacement cost of the building.	Additions where total area is > 5,000 sq. ft. or where alteration or repairs in 24 months are > 75% of the replacement cost of the building.	
Culver City	Height increase or area increase of 50% or more	Height increase or area increase of 50% or more	Story added, 75% of roof structure replaced, or area increased by 75%	
Glendale	Additions > 1000 sq. ft or where the alterations are > 50% replacement value	Additions > 1000 sq. ft or where the alterations > 50% replacement value	Additions > 1000 sq. ft or where the alterations > 50% replacement value	All
Huntington Beach	All buildings with basement or floor areas > 1500 sq. ft and not having 20 sq. ft. openings, except R-1 less than 7 units,	All buildings with basement or floor areas > 1500 sq. ft and not having 20 sq. ft. openings, except R-1 less than 7 units,		
Los Angeles	Alterations > 50% of floor area	Alterations > 50% of floor area	Hillside areas or an addition > 50% of existing floor area	All, except apartments and condominiums
Newport Beach	> 5,000 sq. ft. with some exceptions	> 5,000 sq. ft. with some exceptions	> 5,000 sq. ft. with some exceptions	
Riverside City Fire	Buildings after March 1, 1993 where addition is > 5,000 sq. ft. or 50% of existing area	Buildings after March 1, 1993 where addition is > 5,000 sq. ft. or 50% of existing area	Buildings after March 1, 1993 where addition is > 5,000 sq. ft. or 50% of existing area	
San Diego				All, except apartments and condominiums
San Francisco				All, except apartments and condominiums
San Jose				All, within three years
Santa Monica	Building > 1000 sq.ft. where increase of area by 50% (in 3 yrs) or exposed construction of 50% or building < 1,000 sq.ft. where increase of area is 75% or exposed construction of 75%	Building > 1000 sq.ft. where increase of area by 50% (in 3 yrs) or exposed construction of 50% or building < 1,000 sq.ft. where increase of area is 75% or exposed construction of 75%	Single Family Dwellings (SFD) > 1000 sq.ft. where increase of area is 33 1/3 % or SFD < 1,000 sq.ft. where increase of area is 50%	
Ventura County	≤ 25% of floor area for addition, remodel, or alterations	≤ 25% of floor area for addition, remodel, or alterations	≤ 50 % of floor area for addition, remodel, or alterations or 1,000 sq. ft.	